



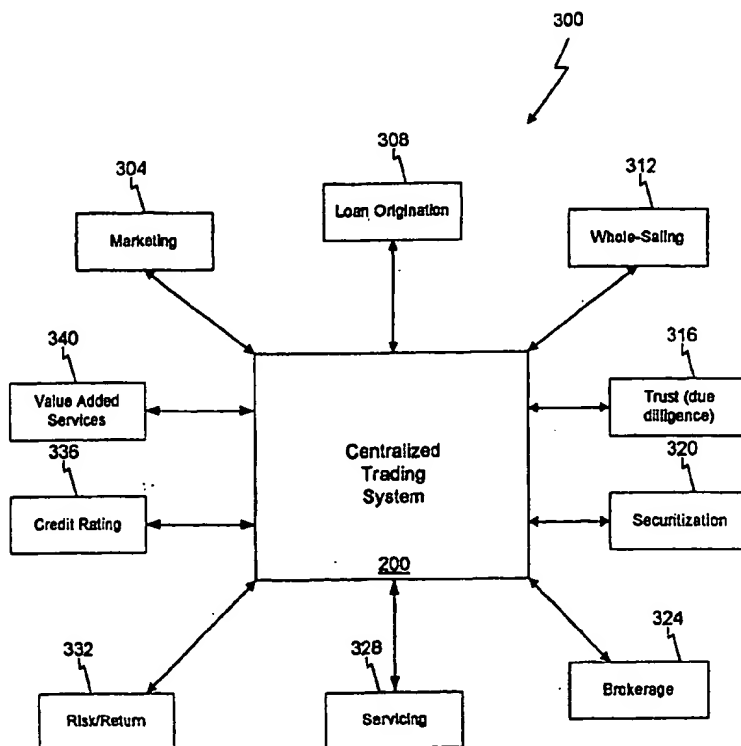
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(54) Title: **SYSTEM, METHOD AND COMPUTER PROGRAM PRODUCT FOR ONLINE FINANCIAL PRODUCTS TRADING**

## (57) Abstract

A system, method and computer program product are provided for an on-line, centralized financial products exchange system which automates and standardizes the secondary market process by applying a data transformation and mapping process to loan information and instantly matching available loans and loan pools with the purchasing criteria of buyers. The system transforms the loan information that is entered by the user into a standardized data format. Data is filtered before being forwarded to a subscriber using a pre-defined criteria selected by the subscriber. The system includes a plurality of Web servers for receiving and providing loan information from and to subscribers on several Web clients and a database server for searching the predefined rules to match potential buyers with sellers. The system also includes a database for storing information relating to negotiations (i.e., bidding) for the sale of loans and for storing predefined rules for pre-registered buyers and sellers. The system further includes a database and server for storing risk/return information that is made available to subscribers for analysis.



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## System, Method and Computer Program Product for Online Financial Products Trading

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### *Background of the Invention*

#### *Field of the Invention*

10           The present invention relates generally to a centralized exchange system for creating a marketplace to buy and sell financial products, and more particularly to a centralized exchange system for the trading of loans.

#### *Related Art*

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Over the past several years, there has been an explosion of computers, and thus people, connected to the global Internet and the World-Wide Web (WWW). This increase of connectivity has allowed computer users to access various types of information, disseminate information, and be exposed to electronic commerce activities, all with a great degree of freedom. Electronic commerce includes large corporations, small businesses, individual entrepreneurs, organizations, and the like, who offer their information, products, and/or services to people all over the world via the Internet.

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Financial products are one of the types of products available through electronic commerce activities. Consumer loan products, one example of financial products available through electronic commerce, are typically divided into two categories--conforming (or conventional) loans and non-conforming (or non-conventional) loans. Conforming loans are low risk loans and include traditional primary residence mortgage loans to consumers with good credit histories and loans to consumers who qualify under certain government-backed loan programs (e.g., Federal Housing Administration (FHA) or the Veterans Administration (VA)).

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In contrast to conforming loans, non-conforming loans pose a higher risk for lenders than conforming loans. Non-conforming loans include loans to

consumers with bad credit (e.g., due to bankruptcy or foreclosure), non-income verification loans (e.g., loans to consumers who have been self-employed for less than 2 years), loans for non-owner occupied properties, loans for non-conventional properties, some commercial (business) loans, and High-Loan-To-Value (HLTV) loans. Generally, non-conforming loans are loans that do not meet the underwriting guidelines of Fannie Mae or Freddie Mac.

For example, HLTV loans are typically obtained by consumers, who by using equity in their homes as collateral, consolidate other (e.g., credit card) debt. These types of loans involve a lender who loans a consumer an amount of money in excess of 100% of the consumer's equity in their home. For example, an "HLTV 125" loan refers to consumer who obtains a loan for 125% of the value of their home.

In more detail, an "HTLV 125" loan would work as follows. A consumer who owns a home valued at \$100,000, and has a first mortgage on that home for 80% of the value (i.e., \$80,000), would have \$20,000 in equity. If the consumer has credit card debts and wanted to borrow money to consolidate these debts, a lender may offer the consumer an HLTV loan. In one scenario, the consumer may be able to obtain a loan for the \$20,000 equity in their home, and borrow against an additional 25% of the value of the home (i.e., another \$25,000) for a total loan of \$45,000. As such, there would now be loans covering 125% of the value of the consumer's home.

Under the current tax laws, this type of loan provides the consumer (i.e., borrower) with a tax advantage because a certain amount of the interest paid on this loan can be deducted on the borrower's income tax returns. In contrast, any interest paid on credit card debt cannot be deducted. Further, the interest rate that a borrower may be able to obtain for an HLTV loan is often less than the interest rate charged by most credit card companies, but amortized over a longer period of time. Thus, consolidating by obtaining an HTLV loan, lowers the borrower's monthly payments and allows the borrower to repay debts owed more quickly. As such, these types of loans are often attractive to consumers.



Non-conforming loans generally are also attractive to lenders because the market will often allow lenders to charge a higher interest rate than on a conventional first mortgage loan (although this interest rate is still lower than that charged by credit card companies). Because lenders are offering the borrower a loan for more than the value of the collateral (e.g., the borrower's home), however, there is a certain amount of risk involved in making such loans. As such, lenders have developed certain rules (based on criteria, such as underwriting criteria) to minimize their risks (i.e., exposure) when making non-conforming loans.

An example criteria used by lenders include identifying potential borrowers in a certain income bracket. This income bracket must be high enough so that there is small likelihood of default, but not so high that the borrower is likely to prepay the loan--thereby decreasing the amount of interest collected by the lender over the life of the loan.

Another criteria often considered by lenders making loans is the borrower's credit rating. A consumer's credit rating is an indication of their ability to pay outstanding debts. Credit rating companies, such as Trans Union Corporation of Chicago, Illinois, Experian, Inc. (formerly TRW) of Orange, California, and Equifax, Inc. of Atlanta, Georgia, collect certain information on individual consumers and assign each a credit rating based on this information.

One method of obtaining a credit rating is known as a "FICO score" which is based on a mathematical model developed by Fair, Isaac, and Company, Inc. of San Rafael, California. A FICO score is based on many factors including how a consumer pays their bills, outstanding debt, how long a consumer has had credit, types of credit a consumer has, and how many times a consumer has recently applied for or opened new lines of credit.

Borrowers are typically graded according to their borrowing habits. "A" borrowers have credit ratings which indicate that they will be able to repay a loan. The ratings given to borrowers fluctuate between institutions, with each institution defining loan borrowing criteria a little differently. For example, instead of just an "A" borrower, an institution may have an A- or B+ category for borrowers.

Loans can also be extended to "sub-prime" borrowers-- individuals with "B" or "C" credit ratings. These subprime borrowers have relatively lower credit scores. Loans in this case may be the borrower's first mortgage on a home, e.g., for which the borrower has a risky credit rating, but they have collateral, such as a home, which has not been previously mortgaged. Similarly, loans can also be extended to borrowers who are seeking a "jumbo" loan--a loan of \$225,000 or more. All of these types of loans, because of the various risks associated with each, often command a higher interest rate than conforming loans.

### *Loan Life Cycle*

Referring to FIG. 1, a time line of a typical loan life cycle 100 is shown. The first phase in the loan life cycle 100 is a marketing phase 104. In marketing phase 104, marketing companies target certain potential borrowers to receive advertisements offering loans. For example, potential borrowers may be targeted by geographic region (e.g., by zip code or area code). This advertising can be distributed through many sources, such as via telephone advertising campaigns, via mass mailings, or via the Internet.

The second phase in the loan life cycle 100 is a loan origination phase 108. In loan origination phase 108, the potential borrower contacts the lender (e.g., mortgage bank), or a broker working with a lender, by phone or electronic mail, to request a loan. Usually, this first contact between the potential borrower and the lender is telephonic, as call centers are typically set up to handle responses to the advertising campaigns. After being switched away from the call intake portion of the call center, certain information is collected from the consumer by a loan agent. The loan agent also works with the potential borrower to agree on a loan amount, interest, points, duration or term of the loan and other features of the loan. The loan agent then sends this information to a loan processor and a loan underwriter for approval.

The loan processor processes the paperwork necessary for completing the loan and the underwriter makes sure the underwriting guidelines are met. During the underwriting process, the underwriter decides whether to make a loan to a

potential borrower based on credit, employment, assets and other factors and then matches the risk of making such a loan to an appropriate rate and term or loan amount. Underwriting guidelines are the rules that the underwriters use to assign risk to a particular loan and to determine whether or not to approve the loan for a particular rate, term and loan amount. As such, the underwriter validates the interest rate and points assigned by the loan agent. If these validated terms are acceptable to both the lender and borrower, the loan is approved, and the loan agent then works with the loan closer to finalize the loan, issue a check, and forward it to the borrower.

The loan may then enter a third phase, known as a loan wholesaling phase 112. Once the lender has made the loan, they often try to sell the loan to investors, e.g., mortgage bankers, insurance companies, institutional investors, etc. Alternatively, a loan may be transferred within a company to a different department that handles the wholesaling of loans. Lenders may flow loans to mortgage bankers (*i.e.*, pass a single loan at a time), or send bulk loans to mortgage bankers (*i.e.*, pass several loans referred to as a "pool" of loans). The mortgage banker then separately pools the purchased loans and advertises the loan pools to look for investors. The role of the mortgage banker is to buy loans from the loan origination organization (e.g., mortgage bank) or lender, and then pool them in such a way to make them attractive to investors.

Mortgage bankers have also developed rules that they use to decide which loans to purchase and how to pool them for sale. These rules are based on many of the same criteria used by the lender in determining whether to originate a loan to the borrower. Similarly, loan origination organizations or lenders consider the rules of the mortgage bankers when making loans, so that their loans look attractive to the mortgage bankers.

The mortgage banker pools the loans and advertises to investors who may be interested in purchasing a pool of loans. For example, a typical pool may consist of 300 loans with an estimated total value of \$30 million or may consist of 3000 loans with an estimated total value of \$300 million. The potential investor, typically a bank, securitization company or another mortgage banker,

will review the information for each loan in the pool and either accept, decline, or reserve its decision for each loan in the pool. Then, the investor may send a revised pool back to the mortgage banker with an offering price to buy the revised pool. The mortgage banker then may add other loans to the pool and resend the pool to the investor for review. This negotiation (or bidding) continues until a sale is made or rejected. The rejected loans may be used in other pools or may be used directly for securitization, as discussed below.

Once an investor purchases or otherwise acquires a pool of loans, the loans may enter a fourth phase, referred to as a securitization phase 116. In securitization phase 116, the investor groups several pools of loans together into a larger pool, and uses them collectively as collateral to back securities (i.e., mortgage-backed securities such as bonds). These larger pools can then be offered for sale to buyers on the secondary market. Typically, these groups of loan pools are valued in the range of \$50 million - \$1 billion. Because the company that purchases the loan pools and uses them to back securities is personally responsible, there is a great deal of risk involved in these type of transactions.

Naturally, investors of the loan pools have developed certain rules for evaluating the suitability of the loans for securitization. However, the mortgage bankers' rules used for grouping certain loans together in a pool may be different from the rules used by the investor in deciding which loans it would like to purchase in a pool and the rules used by lenders in making the underlying loans in the first place. For example, the mortgage banker in an attempt to sell the low risk and high risk loans together, may want to group together loans made to borrowers with high FICO scores with loans made to borrowers with lower FICO scores. However, the investor may have rules which do not allow the purchase of any pool with a loan made to a borrower having a FICO score less than a predetermined amount. As a result, negotiations between the mortgage banker and the investor must occur in order to decide on a pool and a price that is suitable to both parties. It is important to note that although the rules are devised as guidelines for buying and selling loans, these rules may be disregarded or

altered on a case-by-case basis. Further, each entity described above may frequently change its rules based on market conditions and other relevant factors.

5 The process for selling loans or loan pools and then negotiating about the sale is currently ad hoc. Generally, an investor will learn about a pool by calling a particular seller to see what loans or loan pools are available. The seller will then send the investor information about the loan or loan pool generally on a spreadsheet, such as Microsoft® Excel. The investor may reconfigure the information into their preferred format on the spreadsheet, delete or mark those loans from the pool that they do not wish to purchase, and send the spreadsheet  
10 with the revised pool back to the seller. This process is often clumsy and inefficient, requiring a lot of manual data re-entry between the parties.

Further, there is no mechanism, apart from person-to-person (e.g., face-to-face or over the telephone) interaction, for determining what loans or pools are for sale, what rules are being used to pool the loans, and what rules are being used  
15 by the investors to determine whether to buy certain loans. The tools that are available, such as program sheets or rate matrices, are not dynamic, i.e., they are not updated in real-time to reflect current market conditions. Instead, the existing tools are all static as they are typically updated through a manual process.

20 The investors service the loans, either themselves or through a separate servicing firm, and create a mortgage-backed security based on the assets (i.e., future income stream) of the pooled loans. The mortgage-backed security has an assigned interest rate based on the future capital of the pools of loans that are being securitized. The mortgage-backed securities are then generally sold, either directly or through brokerage companies, to buyers in the open market. It is  
25 important to note that the servicing rights to these loans can be sold separately from the loans. In short, the seller may be marketing to two buyers: one for the loans and one for the servicing rights to the loans.

30 The mortgage-backed securities are always securitized by the pool of loans, so that the loans can never be transferred again throughout the remainder of their life cycle 100. Prepayment of loans is a problem, because if a loan is prepaid the mortgage-backed security is no longer backed by all of its original

underlying assets. Companies that securitize these loans have attempted to predict the amount of prepayment of loans in the pools and work this figure into a yield, however many companies have failed because they could not accurately predict the rate of prepayment or default.

5           The loan also follows a separate track with the consumer, concurrently with the first track described above. As shown in FIG. 1, once the loan is approved and the money is sent to the borrower, the loan enters a servicing phase 120. Servicing phase 120 consists of a servicing company sending a coupon book or monthly notice to the borrower which indicates when monthly payments are  
10           due and the amount of the payment. If the borrower is late on a payment, the servicer will contact the borrower to discuss the missed or late payment. This servicing is very methodical, in that servicing companies will often have predefined time periods for certain actions. For example, the servicing company may place a telephone call to a delinquent borrower after his payment is 10 days late, and  
15           write a letter to the delinquent borrower after his payment is 30 days late, and so on.

          If the borrower becomes insolvent or delinquent in their payments, the loan enters the next phase, referred to as a claims phase 124. In claims phase 124 the servicing company may enter a claim against the borrower in a bankruptcy  
20           proceeding, or file a lawsuit in court to foreclose on the mortgaged property or secure an order to garnish the borrower's wages. When the value of the loan is greater than the value of the underlying collateral, lenders are reluctant to enter this phase, because it generally results in the lender losing money. In particular, when one of these loans is used to back a security, and the borrower defaults on  
25           the loan, the collateral used to back the security disappears. This has, in the past, lead to the demise of many securitization companies that back securities with such loans.

          On both tracks, the loan then enters a final phase, referred to as a loan termination phase 128. Generally the loan enters loan termination phase 128 when  
30           the loan has been fully paid, be it at the end of the loan term (e.g., 30 year fixed loan) or earlier (i.e., prepayment).

Therefore, in view of the above, what is needed is a system, method and computer program product for an online (i.e., Internet, Intranet, or Extranet) system for buying and selling financial products. Such a system would create a "marketplace" in which investors (i.e., buyers) and sellers of these financial products could go to place their products for sale, to ascertain what financial products are for sale, and to determine what the price is in the "marketplace" for certain types of products. Further, what is needed is a system, method and computer program product that archives all of the loan information and selection and pricing information for access by its users in a standardized format.

### *Summary of the Invention*

The present invention is a system, method, and computer program product for the online trading of financial products. The present invention is optimized to handle fixed, adjustable, and balloon mortgages as well as first lien (sub-prime, jumbo, conforming) and second lien (sub-prime, home equity, home non-equity, Title I) products. Additional information, such as whether a loan has mortgage insurance or whether an applicant or census tract on which a piece of property is located qualify under the Community Reinvestment Act (CRA), will also be available for loans. In short, the invention automates and standardizes the secondary market process by instantly matching available loans and loan pools with the purchasing criteria of buyers. As such, the invention provides a resource of archived information for subscribers (e.g., marketing companies, lenders, mortgage bankers, investors, brokerage companies, etc.). In this way, every individual involved in the financial products industry can access information stored in the centralized "marketplace" system of the invention to aid in completing transactions relating to the financial products.

The present invention further facilitates the passing of bulk and/or flow loans from a correspondent subscriber to a particular buyer pursuant to a correspondent delivery agreement. In particular, the system of the present invention receives the loan information from the subscriber and translates it into

a data format recognizable to the backoffice system of the particular buyer. The invention may also filter the loan information prior to sending it to the buyer using rules predefined by the buyer. The invention then send the loan information to the buyer's backoffice.

5           The buyer can perform evaluations of the data, such as legal review and automated underwriting and then return a response to the seller via the system of the present invention as to whether the loan has been approved for purchase.

10           In one embodiment, the loan data is transferred using an XML standard processing format. In another embodiment, the loan data is transferred from the seller's system in the seller's data format and mapped and translated to the standardized format. The subscriber may also access certain value added services via the system to aid in the purchasing decision. These value added services may include automated underwriting, automated pricing, rate locking, loan product comparison mapping, credit scoring, credit updates, CRA qualification, and appraisal updates.

15           One advantage of the present invention is that it provides a centralized "marketplace" for trading in certain types of financial products.

20           Another advantage of the present invention is that it reduces the amount of manual re-entry of data when negotiating for the sale of a financial product, such as a loan or loan pool. Furthermore, all data, including data relating to the financial product and trading data, are archived to allow for risk management analysis.

25           Another advantage of the present invention is that it archives information about the financial products and bidding information to be used to determine a market price for the financial products.

30           Another advantage of the present invention is that it archives rules which are predefined by investors and allows for dissemination of these rules so that originators are aware of what loans are in demand in the marketplace and originate the right types of loans, thereby creating an efficiency in loan origination and resale.



Further features and advantages of the invention as well as the structure and operation of various embodiments of the present invention are described in detail below with reference to the accompanying drawings.

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### *Brief Description of the Figures*

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The features and advantages of the present invention will become more apparent from the detailed description set forth below when taken in conjunction with the drawings in which like reference numbers indicate identical or functionally similar elements. Additionally, the left-most digit of a reference number identifies the drawing in which the reference number first appears.

FIG. 1 is a time line showing the typical life cycle of a loan;

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FIG. 2 is a block diagram illustrating the system architecture of a first embodiment of the invention, showing network connectivity among the various components;

FIG. 3 is a high level block diagram showing the interfaces that occur during the operation of the exchange system according to the first embodiment of the invention;

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FIG. 4 is a block diagram illustrating the software architecture according to a first embodiment of the invention, showing communications among the various components;

FIG. 5 is a flowchart showing the data flow between the centralized exchange system and a marketing company, according to the first embodiment of the invention;

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FIG. 6 is a flowchart showing the data flow between the centralized exchange system and a loan origination company, according to an embodiment of the invention;

FIGS. 7-14 are exemplary graphical user interfaces according to a loan origination system of the invention;

FIGS. 15A-15D are flowcharts showing the buying and selling of loans using the centralized exchange system, according to the first embodiment of the invention;

5 FIG. 16 is a flowchart showing the interaction between the centralized exchange system and a trust company, according to an embodiment of the invention;

FIG. 17 is a flowchart showing the data flow between the centralized exchange system and a servicing company, according to an embodiment of the invention;

10 FIGS. 18 and 19 are exemplary graphical user interfaces according to an embodiment of the invention;

FIG. 20 is a block diagram of an exemplary computer system useful for implementing the invention;

15 FIGS. 21-24 are exemplary graphical user interfaces to enable a subscriber to engage in trading according to an embodiment of the invention

FIG. 25 is a block diagram illustrating data flow and formatting between the exchange system and a subscriber;

FIG. 26 is a block diagram illustrating the data transformation and mapping (DTM) process of the invention;

20 FIGS. 27A and 27B are block diagrams illustrating the system architecture of a second embodiment of the invention, showing network connectivity among the various components; and

25 FIG. 28 is a high level block diagram showing the interfaces that occur during the operation of the exchange system according to the second embodiment of the invention.

## *Detailed Description of the Preferred Embodiments*

### *I. Overview*

5           The invention relates to a system, method, and computer program product for analyzing, valuating, buying and selling financial products, such as loans. The loans contemplated for use with the invention include, for example, conforming and non-conforming loans, such as fixed, adjustable, and balloon mortgages, residential mortgage loans, multi-family mortgage loans, commercial mortgage  
10       loans, consumer and commercial installment loans, small business loans, student loans and vehicle/boat/plane loans.

          Although the embodiment described herein relates specifically to loans, it would be apparent to one skilled in the relevant art(s) that the invention could also be used for analyzing, valuating, buying and selling a variety of other financial  
15       products, including, for example: (1) revolving lines of credit, such as credit card accounts and home equity lines of credit, (2) annuities, (3) insurance products, (4) consumer and commercial assets, such as certificates of deposit, and (5) servicing rights.

          In an embodiment of the invention, an organization provides a centralized  
20       exchange system for loans. Subscribers to the system (i.e., brokers, correspondents, mortgage bankers, servicing companies, investors, capital markets brokers, etc.) may engage in trading that optimizes the types of loans being originated by lowering the risk associated with loan origination and maximizes return on each loan.

25           The centralized exchange system of the invention creates a marketplace for trading in financial products, such as loan products. What is meant by marketplace, is a central service that each entity in the above-described loan life cycle can use for handling of loans. This type of system is referred to as an "end-to-end" system, because it is developed for each entity from the beginning to the  
30       end of the loan life cycle 100. The centralized system can also handle just a portion of the "end-to-end" system by integration with a subscriber's system. For

example, if a subscriber has its own loan origination system, the system of the invention can be integrated with this subscriber's system to allow for originated loans from the subscriber's system to be uploaded into the system of the invention for sale.

5           Some of the features provided by the system of the invention include loan origination, loan pooling, publishing loans and loan pools for sale, and negotiating for sale of loans or loan pools. Further, the centralized exchange system provides connection to certain service providers for services such as automatic institution of due diligence investigations and/or loan servicing. The centralized exchange  
10           system also archives and/or warehouses trading data, servicing data and other loan data to provide risk-return information based on certain criteria (*e.g.*, mortgage insurance data, future loan value index, pricing model, and historical valuation data). Still further, the centralized exchange system stores subscribers' trading rules and can notify a subscriber when loan products complying with its rules are  
15           published. The centralized exchange system may also notify subscribers (*e.g.*, by electronic mail, pager, telephone, cellular telephone, personal digital assistant, facsimile, etc.) when an offer for a loan or loan pool has been made and/or when an offer has been accepted or rejected.

          Such a system could allow industry participants such as brokers,  
20           correspondents, mortgage bankers, servicing companies, investors, and capital markets brokers to intelligently originate and trade in loans not only to better hedge against risks, but also to speculate for profit.

          In addition, information such as whether an applicant or census tract of property qualifies under the Community Reinvestment Act (CRA), will also be  
25           available. The information on loans which would qualify under the CRA would be helpful to buyers who are looking to fulfill federally mandated requirements for the purchasing of CRA-type loans. By flagging loans that meet CRA requirements, the invention offers buyers a centralized location to quickly find qualified loans and meet their federal purchase obligations.

30           In one embodiment of the invention, additional value added services may also be available to the subscriber, such as automated underwriting, automated

pricing, rate locking, loan product comparison mapping, credit scoring, credit updates, CRA qualification and appraisal updates.

The centralized exchange system provider organization supplies an infrastructure, secure protocol, and facilities so that subscribers may utilize the network to address their trading needs with little or no modification to the subscriber's current infrastructure required for use of the system of the invention. As detailed above with reference to FIG. 1, the invention addresses the trading needs of the subscribers summarized in Table 1 below. The subscriber names presented in Table 1 are given by way of example, and, as will be apparent to one skilled in the relevant art(s), may vary according to industry custom.

SUBSCRIBER	DESCRIPTION (PHASES OF LIFE CYCLE 100)
Marketing Company	Entities that advertise lenders' financial products to Consumers (phase 104).
Broker	Individuals hired on an agent basis who bring together borrowers and lenders (phase 108).
Mortgage Bank Correspondent	Banks or other lending entities that market and originate loans directly to consumers. They typically then sell the individual loans or loan pools (phases 104-108).
Servicing Company	Entities that, on behalf of owner of the loan, monitor and collect monthly payments from the Borrower, and may institute proceedings against borrower who are delinquent or in default (phases 120-124).
Mortgage Banker	Entities that purchase loans(in flow or in bulk) from different Lenders and then separately pool them together for resale (phase 112).
Investor	Entities that purchase loan pools from wholesalers and group the pools together to create mortgage-backed securities (i.e., securitization), which are then typically sold in the secondary market (phases 116).
Capital Markets Broker/Brokerage Company	Entities that act on an agent basis to bring together Investors and Buyers (phase 116).
Securities Credit Rating Agency	Entities that, typically on behalf of brokerage companies, rate (i.e., determine overcapitalization) the mortgage-backed securities created by Investors (phase 116).

SUBSCRIBER	DESCRIPTION (PHASES OF LIFE CYCLE 100)
Securities Buyer	Individuals or Entities that purchase (and trade) mortgage-backed securities (phase 116).

TABLE 1

5 Each subscriber of the centralized exchange system supplies the system with information about its trade activities with each of the other subscribers on the system. The centralized exchange system uses this information along with market data in several ways as will be described below.

10 The invention is described in terms of the above example. This is for convenience only and is not intended to limit the application of the invention. In fact, after reading the following description, it will be apparent to one skilled in the relevant art(s) how to implement the following invention in alternative embodiments (e.g., other types of loans and other financial products).

15 The terms "subscriber," "user," "person," "buyer," and "seller" are used interchangeably throughout herein to refer to those who would access and use the exchange system of the invention.

## II. *Criteria for Evaluating a Loan*

20 The embodiment of the invention discussed herein relates to the trading of loans, and, thus, relates to the valuation of the loans and loan pools. In the relevant art(s), certain criteria are commonly used for the valuation of loans. In an embodiment of the invention, subscribers can create, remove and modify rules, based on these criteria, to set up a subscriber's own "preselected rules" to filter the loan or loan packages before purchase. Examples of these loan valuation  
25 criteria are provided in Table 2 below.

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	<b>LOAN VALUATION CRITERIA</b>
5	Loan Amount
	Credit Score
	Appraisal Value of Property
	Total Monthly Income
	Total Monthly Debt
	Assets and Liabilities
10	Term of Loan
	Type of Loan
	Interest Rate
	Loan/Value Ratio
	Debt/Income Ratio
15	Purchase Balance
	Original Balance
	State

TABLE 2

As will be apparent to one skilled in the relevant art(s), many other criteria may exist on which subscribers may wish to base their purchase rules.

An example of a preselected rule that a buyer may use is if the buyer wants to purchase only those loans with an interest rate of 13% or greater and a loan/value ratio of 115 or less. Different buyer companies create their own rules, according to their business model. Companies use these rules to filter available loans to minimize risks associated with purchasing loans. These rules can be preselected and incorporated into a Rules Based Filter in the exchange system of the invention. Further, the subscribers can access historical loan data via the system of the invention to develop new rules to further assist in minimizing risk.

In one embodiment, subscribers can monitor other subscriber's rules in order to originate or acquire loans or loan pools that will be easy to sell and that will command a higher price. Further, each subscriber can post program matrices, underwriting guidelines, and partner due diligence requirements, which assist sellers in determining potential buyers for their loan or loan pools and which assist buyers in analyzing the criteria used to originate loans that are for sale.

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### *III. System Architecture*

Referring to **FIG. 2**, a block diagram illustrating the physical architecture of a centralized exchange system 200, according to a first embodiment of the invention, showing network connectivity among the various components, is shown. It should be understood that the particular centralized exchange system 200 shown in **FIG. 2** is for illustrative purposes only and does not limit the invention.

The components of the exchange system 200, as shown in **FIG. 2**, are divided into two regions--"inside" and "outside." The components appearing in the inside region refer to those components that the exchange system provider organization would preferably have as part of their infrastructure in order to create a marketplace for online trading of financial products and provide the services contemplated by the invention. As will be apparent to one skilled in the relevant art(s), all of components "inside" of the centralized exchange system 200 are connected and communicate via a private wide or local area network (WAN or LAN 264).

In contrast, the components appearing in the outside region refer to the infrastructure that the subscribers to the exchange system 200 would obtain or already have in place in order to participate in the exchange system 200. In this embodiment, the inside components and the outside components are connected via a secure exchange through the global Internet 260, running a secure communications protocol (e.g., secure sockets layer (SSL)), which includes the Worldwide Web (WWW) 266. In one embodiment, the connection to the Internet 260 is through a router. In this embodiment, the router may be replicated ("mirrored") for fault tolerance, as shown in **FIG. 2** as routers 262a and 262b. As is well-known in the relevant art(s), routers, available from vendors such as Cisco Systems, Inc. of San Jose, CA, forward packets between networks.

The exchange system 200 includes a trading subsystem 210. The trading subsystem 210 serves as the "back-bone" (i.e., trading processing system) of the invention. The trading subsystem 210 includes a trading server 202 and an



exchange system database server 207. The trading server 202 provides the "front-end" for the trading subsystem 210. Trading server 202 is a typical Web server process running at a Web site which sends out web pages in response to Hypertext Transfer Protocol (HTTP) requests from remote browsers (i.e., certain subscribers of the exchange system 200). That is, trading server 202 provides the graphical user interface (GUI) to certain users of the exchange system 200 in the form of Web pages. In an embodiment of the invention, trading server 202 may be implemented using a Windows NT™ server platform, and database server 207 may be a Sun SPARC station platform running the Solaris operating system.

The exchange system database server 207 includes a trade database and a trading criteria archive. In an embodiment of the invention, these two databases are mirrored for fault tolerance and thus shown as databases 203a and 203b and archives 204a and 204b. The trading subsystem 210 also includes a securitization server 206 connected to a securitization database 205.

The trading subsystem 210 also includes an administrative workstation 201 (e.g., an IBM™ or compatible PC workstation running the Microsoft® Windows 95/98™ or Windows NT™ operating system) that may be used to update, maintain, monitor, and log statistics related to the trading server 202 and the exchange system 200 in general (e.g., check cards, network connections, software, hardware, etc.).

The exchange system 200 may also include a portfolio subsystem 220. The portfolio subsystem includes a portfolio server 224 that provides a GUI to certain users of the exchange system 200 in the form of Web pages. The portfolio server 224 is connected to one or more organization pool databases. In a first embodiment of the invention, there is an organization pool database that stores data for each organization that subscribes and posts pools to the exchange system 200. For example, FIG. 2 shows an organization 1 pool database and an organization 2 pool database. Both of these databases are mirrored for fault tolerance and thus shown as pool databases 221a and 221b and 222a and 222b, respectively. The portfolio server 224 is also connected to a wholesaling criteria archive 223.

The wholesaling subsystem 220 also includes a boarding relay server 225 which is connected to an origination archive 226. The relay server 225 allows data from the origination subsystem 240 (described below) to be collected and archived into the origination archive 226. This allows loan data to be immediately accessed by other subscribers of the system 200 (*e.g.*, the servicing subsystem 250).

The exchange system 200 may also include a marketing subsystem 230. The marketing subsystem 230 includes a marketing database 231 connected to a marketing server 232 that provides a GUI to certain users of the exchange system 200.

The exchange system 200 may also include an origination server 270 and a bankruptcy server 290 that each provide a GUI to certain users of the exchange system 200. These two servers complete the inside region of the exchange system 200.

Within the outside region of exchange system 200 may be a loan origination subsystem 240. While one loan origination subsystem 240 is shown in FIG. 2, it will be apparent to one skilled in the relevant art(s) that a plurality of loan originating entities, each with their own loan origination subsystem 240 infrastructure, may subscribe to the exchange system 200 and thus access the above-described components inside of the system.

The loan origination subsystem 240 typically includes a loan origination interface 243 workstation. In an embodiment of the invention, a consumer (*i.e.*, borrower) would call into the subsystem 240 via the public service telephone network (PSTN) 248 to apply for a loan. A customer service agent, working for the loan originating entity would gather the information using a GUI on the interface workstation 243. Again, while one origination workstation 243 is shown in FIG. 2, it will be apparent to one skilled in the relevant art(s) that a loan origination entity will employ a plurality of customer service agents within a call center, thus necessitating a plurality of workstations 243. The workstation 243 is connected to a loan origination server 242. Server 242 provides the back-end processing of the loan origination subsystem 240. The server 242 is connected to

an origination database 244 and a criteria database 245. The loan origination subsystem 240 also includes a manager workstation 246 which allows the manager of the loan origination entity to manipulate the data in the criteria database 245 and perform supervisory functions over the customer service agents using the workstations 243. The loan origination subsystem 240 also includes a router 247--similar in functionality as routers 262a and 262b described above--which allows origination data to be securely uploaded to the inside of the exchange system 200 via the Internet 260.

During the loan origination process, the loan origination subsystem 240, via router 247 and the Internet 260, may obtain credit history data from a credit service bureau represented by a frame cloud 268.

The outside region of exchange system 200 may also include a servicing subsystem 250. The servicing subsystem 250 typically includes a servicing server 252 connected to a servicing database 251. Many servicing companies utilize mortgage service software such as the Mortgage Servicer Systems software available from Financial Industry Computer Systems (FICS) Group of Brussels, Belgium. Thus, the servicing database 251 could contain FICS data which would interface with the exchange system 200 via a router 253--similar in functionality as routers 262a, 262b and 247 described above-- and the Internet 260.

While one servicing subsystem 250 is shown in FIG. 2, it will be apparent to one skilled in the relevant art(s) that a plurality of loan servicing entities, each with their own loan servicing subsystem 240 infrastructure, may subscribe to the exchange system 200 and thus access the above-described components inside of the system. Loan servicing entities would provide exchange system 200 subscribers, via the router 253 and the Internet 260, with information about each loan such as prepayment, delinquency, default, etc. In an embodiment of the invention, this information can be provided as continuous live data or via pre-scheduled (*i.e.*, nightly, weekly, etc.) batch uploads. This allows exchange system 200 subscribers to have up-to-date information about each loan within a pool for risk management analysis.

Also located in the outside region of the exchange system 200 are a plurality of workstations 280a-h which, via the WWW 266 (and thus, Internet 260), access the components inside of the exchange system 200. As will be described in more detail below, **FIG. 2** shows a workstation representative of each type of subscriber of the exchange system 200. As will be apparent to one skilled in the relevant art(s), each type of subscriber would be provided a different set of GUI screens to access their respective functions of interests within the exchange system 200. Accordingly, as suggested by **FIG. 2**, each type of subscriber would access a different subsystem inside of the exchange system 200 (each with their own URL and servers providing the GUI screens).

For example, rather than calling into the loan origination subsystem 240 as described above, consumers may use the workstation 280b to apply for a loan. During processing of the loan, the system 200, via router 262a and/or 262b and the Internet 260, may obtain credit history data from a credit service bureau represented by the frame cloud 268.

In an alternative embodiment of the invention, the workstations 280, and thus subscribers, may also access the exchange system 200 by a direct telephone dial-up connection without the need to go through the WWW 266 or the Internet 260.

In an embodiment of the invention, all of the servers (202, 206, 224, 225, 232, 270, and 290) described above would be implemented using a Windows NT™ server platform. Furthermore, each workstation (201, 243, 246, and 280) described above can be realized with a PC workstation running the Microsoft® Windows operating system. The software and hardware architecture of exchange system 200 is described in more detail below with reference to **FIG. 4**.

While a set of servers (*i.e.*, servers 202, 206, 224, 225, 232, 270, and 290) are shown in **FIG. 2** for simplicity of explanation, it will be apparent to one skilled in the relevant art(s) that exchange system 200 may be run on a single server as well as in a distributed fashion over a plurality of the servers connected via LAN

201. Further, in an alternate embodiment of the invention, exchange system 200 may be structured as a multi-tier system rather than the client-server model presented herein.

**FIG. 2**, also for simplicity of explanation, illustrates only one workstation 280a-h for each type of subscriber to the exchange system 200. As will be apparent to one skilled in the relevant art(s), however, the workstations 280a-h represents the GUI interface provided to each type of subscriber and thus, a plurality of workstations 280a-h would exist in the system 200, each possibly residing at different physical locations and used by different subscribing entities.

Similarly, while several databases (*i.e.*, databases 203a, 203b, 204a, 204b, 205, 221, 222, 223, 224, and 231) are shown in **FIG. 2**, it will be apparent to one skilled in the relevant art(s) that exchange system 200 may utilize databases physically located on one or more computers which may or may not be the same as their respective servers. Exchange system 200 may also utilize a different scheme for allocating where the data within the system physically resides.

In a second embodiment of the invention, illustrated in **FIGS. 27A** and **27B**, the exchange system 2700 functions in much the same manner as exchange system 200. In **FIG. 27A**, the portfolio subsystem 220 is replaced by a correspondent delivery system 2720. Correspondent delivery system 2720 allows a subscriber to send loan(s) to another particular subscriber. In one embodiment, a subscriber may enter a contract with another subscriber to purchase a pre-set number of loans. Correspondent delivery system 2720 delivers these loans directly from the seller to the buyer.

Correspondent delivery system 2720 includes a correspondent delivery server 2722 and a correspondent delivery system database server 2727. Correspondent delivery server 2722 provides the "front-end" for correspondent delivery system 2720. Server 2722 is a typical Web server process running at a Web site which sends out web pages in response to Hypertext Transfer Protocol (HTTP) requests from remote browsers (*i.e.*, certain subscribers of the exchange

system 2700). That is, server 2722 provides the graphical user interface (GUI) to certain users of exchange system 2700 in the form of Web pages. In an embodiment of the invention, server 2722 may be implemented using a Windows NT™ server platform, and database server 2727 may be a Sun SPARC station platform running the Solaris operating system.

Correspondent delivery system database server 2727 includes a correspondent delivery database and a correspondent delivery criteria archive. In an embodiment of the invention, these two databases are mirrored for fault tolerance and thus shown as databases 2723a and 2723b and archives 2724a and 2724b.

Correspondent delivery subsystem 2720 also includes an administrative workstation 2721 (e.g., an IBM™ or compatible PC workstation running the Microsoft® Windows 95/98™ or Windows NT™ operating system) that may be used by the correspondent organization subscriber to update, maintain, monitor, and log statistics related to server 2722 and exchange system 2700 in general (e.g., check cards, network connections, software, hardware, etc.).

As shown in this embodiment in FIG. 27B, exchange system 2700 further includes a value added subsystem 2730. Value added subsystem 2730 represents one or more subsystems that allow subscribers to perform various value added services, such as automated underwriting, automated pricing, rate locking, loan product comparison mapping, credit scoring, credit updates, CRA qualification and appraisal updates.

For example, in the case of automated underwriting, the system 2700 and subsystem 2730 allow subscribers to run selected loans through an automated decision engine to perform automated underwriting on the selected loan(s). Similarly, in the automated pricing system, the system 2700 and subsystem 2730 allow subscribers to run selected loans through an automated pricing engine to automatically assign a price to each selected loan. Each of the value added services listed above will be discussed in further detail below in Section X.

Value added subsystem 2730 includes a value added system server 2732 and a value added system database server 2737. Value added system server 2732 provides the "front-end" for each of the value added services available through subsystem 2730. Value added system server 2732 is a typical Web server process running at a Web site which sends out web pages in response to Hypertext Transfer Protocol (HTTP) requests from remote browsers (i.e., certain subscribers of the exchange system 2700). That is, server 2732 provides the graphical user interface (GUI) to certain users of exchange system 2700 in the form of Web pages. In an embodiment of the invention, server 2732 may be implemented using a Windows NT™ server platform, and database server 2737 may be a Sun SPARC station platform running the Solaris operating system.

Value added system database server 2737 includes a rules database and a historical loan data archive. In an embodiment of the invention, these two databases are mirrored for fault tolerance and thus shown as databases 2733a and 2733b and archives 2734a and 2734b.

Value added subsystem 2730 also includes an administrative workstation 2731 (e.g., an IBM™ or compatible PC workstation running the Microsoft® Windows 95/98™ or Windows NT™ operating system) that may be used by the subscriber to update, maintain, monitor, and log rules, filters and statistics related to server 2732 and exchange system 2700 in general (e.g., check cards, network connections, software, hardware, etc.).

As will be apparent to one skilled in the relevant art(s), all of components "inside" of the system 2700 are connected and communicate with routers 262a and 262b via a private wide or local area network (WAN or LAN 264). Similarly, all of the components "inside" of the system 2700 are connected and communicate with each other via a private wide or local area network (WAN or LAN 2764).

More detailed descriptions of the components of exchange systems 200 and 2700, as well as their functionality, are provided below. However, a summary of the databases in each system is provided in Table 3 below.

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DATABASE	DESCRIPTION
Trade Data 203a, 203b	Contains results data, pool negotiating (bidding) data, and financial data (e.g., prime rate, Dow Jones Industrial Average, etc.)
Trading Criteria Archive 204a, 204b	Contains rules used by subscribers to identify loans and loan packages to purchase. An example rule may be: [ (FICO > 400) AND (Appraisal_Value_of_Property > \$300,000) ]
Securitization 205	Contains mortgage-backed securities (e.g. bond) data and criteria
Pool Data Org N 221, 222	Contains data of published pools for each of N mortgage bankers that subscribes to exchange system 200.
Wholesale Criteria Archive 223	Contains rules used by mortgage bankers to identify loans and loan pools to purchase.
Origination Archive 224	Contains origination data uploaded from origination entities subscribing to exchange system 200.
Marketing 231	Contains list of contacts ( <i>i.e.</i> , people), and correlations to financial products likely to be or actually owned, and financial products they are likely to purchase.
Origination Data 244	Contains information gathered from borrowers and stored locally at each loan origination subsystem 240
Origination Criteria 245	Contains rules used by loan originators to identify consumers whom to approve loans to.
Servicing 251	Contains data relevant to servicing of loans such as payment history, default, call (enforcement) history, etc.
Correspondent Trade Data 2723a, 2723b	Contains data relating to the loans transferred from a particular correspondent subscriber to a particular buyer and data relating to loans refused by buyer.
Correspondent Criteria Archive 2724a, 2724b	Contains rules used by buyers to accept and approve loans from correspondent subscribers.
Automated Decision Rules Data 2733a, 2733b	Contains rules used to perform automated underwriting of a loan.
Automated Decision Loan Data Archive 2734a, 2734b	Contains loan data on loans processed through the automated decisions subsystem.

TABLE 3



#### *IV. Secure System Interfaces*

Referring to **FIG. 3**, a high level block diagram shows the secure system interfaces 300 that occur during the operation of exchange system 200 according to an embodiment of the invention. As shown by the arrows connecting the various interfaces to system 200, subscribers (e.g., brokers, correspondents, mortgage bankers, servicing companies, investors, capital markets brokers, etc.) can access system 200 in order to upload and/or download information. As will be apparent to one skilled in the relevant art(s), such system access described below can occur via workstations 280a-280h, where the corresponding server (e.g., 202, 206, 224, 225, 232, 270, and 290) provides a GUI, and data is passed to and from databases 203a, 203b, 204a, 204b, 205, 221, 222, 223, 224, and 231, as applicable.

A secure marketing interface 304 allows marketing companies to access system 200 via workstation 280a. Marketing companies retrieve information from system 200 such as which of their mailings resulted in loans being originated. Further, marketing companies can retrieve information from system 200 relating to which loan applicants, who were originally targeted by their mailings, were denied loans. Further, the marketing companies can access rules predefined by the loan originators (e.g., zip codes, age, geographic region, etc.), so that they can accurately target those potential borrowers that fit within the originators' requirements. Interface 304 also shows that the marketing companies send information back to system 200. Such information may include a list of those individuals who received a mailing regarding a specific loan product.

A secure interface 308 allows data flow between system 200 and a loan origination company (i.e., a bank or other commercial lender) via loan origination subsystem 240. A loan originator will collect loan origination information from an applicant (i.e., consumer), usually via the telephone or via the applicant entering some origination information via workstation 280b. This information is

then forwarded by system 200 to loan origination subsystem 240 via the WWW 266.

5       The loan originator will then use the information collected to process the loan and forward information regarding whether the application was approved or denied to the system 200. This information is then archived in origination archive 226 so that it may be accessed in some form by other subscribers of the system 200.

10       The loan originator, once it has originated a loan or a pool of loans, may send information concerning the loan(s) to the system 200 to post or publish the loans for sale to mortgage bankers.

A secure interface 312 allows mortgage bankers to access system 200, via workstation 280f to (1) pool its own loans together for resale, and/or (2) search for loans that have been posted for sale by loan originators or other mortgage bankers for sale.

15       In the first instance, an investor may use workstation 280f to review its loans and to search through the loan data using various criteria to select particular loans to be pooled together for sale. These loan pools are stored in databases 221 and 222. Once a mortgage banker has created a loan pool, he can publish it by sending it to the exchange system 210 to be published.

20       In the second instance, investors use workstation 280d to access system 200 to look for loans for sale. The investors then input an offer for certain loans that meet their predefined rules.

25       As discussed in further detail below, the mortgage bankers' predefined rules, that were created, deleted and/or modified by the subscriber, are archived in criteria archive 223 and are accessible to the loan originators. As such, the loan originators can review these predefined rules before originating a loan to make sure that its loans will be attractive to the mortgage bankers. This process maximizes returns.

In one embodiment of the invention, the mortgage bankers can register with system 200 to be notified if any loans are posted for sale that fall within its predefined rules. Such notification can be made via electronic mail, any type of digital/wireless communications (e.g., by pager, telephone, cellular telephone, facsimile, personal digital assistant, etc, possibly using Hand-held Device Markup Language (HDML), Voice Markup Language (VoxML), eXtensible Markup Language (XML), or other similar computer language) or simply upon accessing system 200 via a GUI dialogue box. Further, a seller can contact a particular buyer via system 200 if it has a loan for sale that it believes the buyer would be likely to purchase.

The mortgage bankers can search the available loans on system 200 using various search criteria, either based on the mortgage bankers' predefined rules, or based on some other criteria, to quickly locate those loans that meet their requirements. For example, if a mortgage banker wants to purchase only loans made to borrowers having a FICO score greater than 600 and an interest rate of 13% or greater, the mortgage banker could use system 200 to search for loans having these criteria. Similarly, the mortgage banker could have predefined rules, using these criteria, so that they can be notified when such loans, meeting these criteria, are posted for sale.

Once the investor makes an offer for a loan that is accepted by the seller, the mortgage banker must perform a due diligence analysis on the loan to be purchased to make sure it is a valid loan. In an embodiment of the invention, mortgage bankers can authorize system 200 to automatically initiate transfer of loan files from the seller to a trust company and/or loan custodian upon purchase of a loan by the mortgage banker. The mortgage banker can select one or more particular trust companies and/or loan custodians in advance for all of its loans.

In one embodiment, the mortgage banker simply enters an address to which a hard copy of the loan file is to be sent. In another embodiment, the documents in the loan file are scanned and uploaded to the exchange system of the

invention. Once the exchange system receives authorization from the seller, the data file containing the scanned documents from the loan file is transferred to the mortgage banker (e.g, the buyer), transferred directly to the buyer's trust company to perform the due diligence analysis of the loan, or transferred directly to the buyer's loan custodian for safekeeping.

A secure interface 316 allows trust companies to access system 200 via workstation 280c. Upon receipt of the loan files, the trust company will perform a due diligence analysis on the loan (or on a statistical sampling of several loans from a pool of loans). The due diligence analysis will ensure that the supporting documentation provided by the borrower matches the information the lender relied on in approving the loan (*i.e.*, the information entered into the loan application). Once the due diligence is completed, the trust company will forward a certificate to the mortgage banker which includes verification of the authenticity of the loan(s).

Once the mortgage banker has accumulated several loans, the workstation 280f, as discussed above, can be used to post or publish a pool of these acquired loans for sale.

A secure interface 320 allows securitization companies to access system 200 to (1) search for loan pools that have been posted on system 200 for sale by mortgage bankers and (2) to sell mortgage-backed securities that they have created and backed with their loan pools.

In the first instance, the securitization companies access system 200 via workstation 280d to look for loan pools for sale and to review information for each loan in a pool and individually accept, deny, or suspend its decision for each loan within the pool. This will result in a revised loan pool for which the securitization company may make an offer. The mortgage banker can then access, via interface 312, the revised loan pool, and either accept the securitization company's offer, create another pool to offer for sale, or reject the offer.

As discussed above, the seller, in this case the investor, can access the securitization companies' predefined rules, which are stored in the securitization database 205, before posting a loan pool so that a pool that will look particularly attractive to a buyer/investor can be created, thereby maximizing their chances of selling the pool. In one embodiment of the invention, the securitization companies can ask to be notified by system 200 if any loan pools are posted that fall within its predefined rules. Such notification can be made via electronic mail, any type of digital/wireless communications (*e.g.*, pager, telephone, cellular telephone, facsimile, personal digital assistant, etc., possibly using HDML, VoxML, XML, or other similar computer language) or simply upon accessing the system 200 via a GUI dialogue box. Further, a seller can contact a particular securitization company via system 200 if it has a loan pool for sale that it thinks the securitization company would be likely to purchase.

The securitization companies can search the available loan pools on system 200 using various search criteria, either based on the predefined rules, or based on some other criteria, to quickly locate those loan pools having loans that meet its requirements. Further, the securitization companies can search within a selected loan pool to automatically decline or accept particular loans within a pool that have certain criteria. For example, if a securitization company desires to purchase only loan pools having loans made to borrowers having a FICO score greater than 650 and an interest rate of 12% or greater, the securitization company could use system 200 to search for loans having these criteria. Similarly, the securitization companies could have predefined rules, using these criteria, so that it can be notified when such loan pools, meeting these rules, are posted for sale.

Once the investor has acquired several loan pools, it can access system 200 via workstation 280e to group together the loan pools to back a security (*i.e.*, create a mortgage-backed security). As shown in FIG. 3, an interface 324 allows the brokerage companies to be able to access system 200 via a workstation 280d

to look for mortgage-backed securities for sale and to negotiate to buy and sell the mortgage-backed securities.

5 Because the loans are being used as collateral to back a security, they cannot be resold. As such, the securitization company is responsible for servicing the loans for the remainder of their lifetime. This task is often delegated to a servicing company, as discussed below.

10 A secure interface 328 allows a servicing company, via workstation 280h, to access the exchange system 200 to acquire loan information on the loans it has been asked to service and to provide information back to system 200, such as payment history, prepayment rates and/or default.

15 A secure interface 332 allows trading organization personnel, via the administrative workstation 201, as well as all subscribers via workstation 280g, to access exchange system 200 in order to perform certain risk management functions. For example, a mortgage banker who is thinking about purchasing a particular loan, may access data in database 203a to determine what a fair price for a particular loan or loan pool might be, based on previous trades of similar loans.

20 A secure interface 336 allows a credit rating agency, typically hired by the brokerage firm to rate a mortgage-backed security, to access exchange system 200 to review the payment history and risk-return information in order to rate a particular security. For example, the credit rating agency can review the payment history of the loans used to back a particular mortgage-backed security, to determine whether the loans are likely to be prepaid or go into default.

25 A secure interface 340 allows subscribers to access various value added services available via exchange system 200, such as automated underwriting, automated pricing and other value added services, as discussed below in Section X.

Referring now to FIG. 28, a second embodiment of the present invention shows the secure system interfaces 2800 that occur during operation of exchange

system 2700. A centralized trading system 2802 is provided. In this embodiment, system 2802 is divided into an open trading platform 2804 and a correspondent delivery system (CDS) platform 2806. Open trading platform 2804 is that part of system 2802 that is open for access by all subscribers for trading loans via exchange system 2700, as described above with respect to FIG. 3.

CDS platform 2806 is a portion of system 2802 that is dedicated to a particular business-to-business transfer of loans. Particular correspondents who have contractual obligations to a particular buyer to provide the buyer with loans can use CDS platform 2806 to pass these loans to the buyer. The correspondent can forward these loans one-by-one, i.e., flow, or several at a time, i.e., bulk. The arrows shown in FIG. 28 differentiate between flowed loans, shown with the dashed-line arrows, and bulk loans, shown with the solid line arrow.

As shown by the arrows connecting the various interfaces to system 2802, subscribers can access system 2802 in order to upload and/or download information. As will be apparent to one skilled in the relevant art(s), such system access described below can occur via workstations 280a-280h, where the corresponding server (e.g., 202, 2722 and 2732) provides a GUI, and data is passed to and from databases 203a, 203b, 204a, 204b, 205, 2723a, 2723b, 2724a, 2724b, 2733a, 2733b, 2734a and 2734b, as applicable.

A secure interface 2808 allows open correspondent subscribers to access open trading platform 2804 of system 2802 via a workstation, as described above with reference to FIG. 3.

Secure interfaces 2810 and 2812 allow data flow between flow or bulk correspondent subscribers and CDS platform 2806 of system 2802. In the embodiment shown in FIG. 28, secure interfaces 2810 and 2812 link subscribers to system 2802 via an interface 2814. For example, a particular buyer can use CDS platform 2806 to receive loans from its correspondents. The buyer can provide a link on its own interface 2814 (e.g., a Web site) to system 2802. As such, in one embodiment, the flow and loan correspondent subscribers would

access their dedicated buyer's Web site and upload the loan information via secure interfaces 2810 and 2812. The loan information is passed through interface 2814 to CDS platform 2806. In one embodiment, the transfer of data is transparent to the flow and bulk correspondent subscribers. As would be apparent to one skilled in the art, in another embodiment the flow and/or bulk correspondent subscribers could access CDS platform 2806 directly, rather than accessing it through interface 2814.

In the case of bulk interface 2812, this interface includes a GUI that allows the subscriber to select which loans to include in the bulk transfer, similar to the interface discussed above with respect to workstation 280f which can be used by a seller to create a pool of loans for sale on the exchange system.

Once the CDS platform 2806 receives the loan data, it performs data transformation and mapping, as discussed below with reference to FIGS. 25 and 26, to convert the data to match the data formats used by the buyer. CDS platform 2806 will then make an automated determination whether submitted loans meet purchase criteria as defined by the buyer company by performing automated underwriting of the loan. This eliminates the need for manual review of the loan information. Loans meeting the criteria and data validation checks will be identified and available for sending to a proprietary backoffice 2816. Loans not meeting the criteria and/or data validation checks will be flagged for the buyer company to either override or send back to the correspondent subscriber with a reason for the rejection. The CDS platform 2806 may also perform other automated functions, such as automated pricing, slotting or loan classification, and rate locking of loans passed through the platform.

The data is then passed, in bulk or flow, to backoffice 2816 of the particular buyer. As shown by way of example only, a backoffice 2816 may include a loan origination interface 2818, an automated underwriting interface 2820 and/or a bulk bids interface 2822. Loan origination interface 2818 actually boards the loans sent by the correspondent onto the buyer's backoffice system.



Automated underwriting interface 2820 is used to pass the loan data through the buyer's own underwriting program. Bulk bids interface 2822 is used to allow a buyer to accept or decline individual loans in a bulk sale and to make pricing decisions on a bulk loan sale. As would be apparent to one skilled in the relevant art, the system of the invention could be configured to transfer the loan data to various other interfaces/systems, suited for a particular buyer's backoffice system. Further, it would be apparent to one skilled in the relevant art that the system of the invention could be configured to allows subscribers to choose from among multiple backoffices 2816 so that a subscriber could shop the loan to several different prospective buyers via CDS platform 2806.

In an embodiment of the invention, the subscriber also has access via CDS platform 2806 and/or open trading platform 2804 to various subscriber tools and value added services, discussed in detail below in Sections IX and X.

Backoffice 2816 will send information back to the subscribers via CDS platform 2806. This information may include, for example, whether the buyer will fund a particular loan application, whether the buyer will accept a closed loan (e.g., already funded), and/or whether additional loan information is required by the buyer before the loan(s) will be approved. If a loan is approved, the trade may continue, as discussed above with regard to due diligence, etc. If the buyer refuses to accept a particular loan, the correspondent subscriber could then use open trading platform 2804 to try to sell the loan on system 2802 to another buyer.

## V. *Software/Hardware Architecture*

Referring to FIG. 4, a simplified block diagram illustrating a software/hardware architecture 400 according to an embodiment of exchange system 200, showing communications among the various components, is shown.

The architecture 400 of exchange system 200 includes software code that implements the interfaces 300 (via the workstations 280) during the operation of exchange system 200.

5           Architecture 400 includes a database 402 which represents any one of the collection of database within the inside region of exchange system 200 (*i.e.*, databases 203a, 203b, 204a, 204b, 205, 221, 222, 223, and 224). In an embodiment of the invention, database 402 may be implemented using a high-end object-oriented database product such as ObjectStore™ available from Object Design, Inc. of Burlington, MA, or a relational database such as Oracle. As well known in the relevant art(s), in an object-oriented database, data is stored as  
10           objects and can be interpreted only using the methods specified by its class. The relationship between similar objects is preserved as are references between objects. This allows queries to be faster than with relational databases because an object can be retrieved directly without a search, by following its object identifier.

15           The database 402 is connected to a Web server 404 which represents any one of the collection of servers within the inside region of exchange system 200 (*i.e.*, servers 202, 206, 224, 225, 270, and 290). As mentioned above, in an embodiment of the invention, all of the servers would be implemented using a Windows NT™ server platform running ("back-end") software implemented in  
20           a high level programming language such as the C++ programming language.

          In an embodiment of the invention, the server 404 software application communicates with the database 402 using a C++ object interface. In the special case of the trading subsystem server 202, the database sever 207 (not represented in FIG. 4) interconnects it to the databases 203a and 204a. In an embodiment of  
25           the invention, the server 207 is a Sun SPARC workstation running the Solaris operating system that provides highly scaleable hardware solutions. The trading subsystem server 202 then performs the management (*i.e.*, opening, closing, etc.) of sessions.

The database server 207 would communicate with the databases 203a and 204a, and the server 202 using a structured query language (SQL) commands interface.

5           The sever 404 also provides the secure GUI "front-end" for exchange system 200. The GUI front-end can be customized for each type of subscriber to the system. In an embodiment of the invention, the front-end is implemented using the Active Server Pages (ASP), Visual BASIC (VB) script, and JavaScript™ sever-side scripting environments that allow the creation of dynamic Web pages. The subscriber may use custom software to allow the user to deliver  
10           a binary or ASCII file as part of an HTTP form submission.

          These Web pages are provided to the subscribers of the exchange system 200 via the workstations 280a-h (collectively shown as "Web Clients" 406), using the Hypertext Transfer Protocol (HTTP) thereby providing the front-end to the subscribers 408 (e.g., borrowers, brokers, correspondents, mortgage bankers,  
15           servicing companies, investors, capital markets brokers, etc.). The user interface for Web Clients 406 is browser implemented, using Java, JavaScript™, and Hypertext Markup Language (HTML). As such, the external workstations 222 and the internal workstations 224 may be realized with IBM™ (or compatible) PCS running the Windows NT™ or Windows 95/98™ operating system.

20           In an embodiment of the invention, as mentioned above, subscribers 408 may request that system 200 notify them if any loans, loan pools, or desired information which fall within its predefined rules are available. As discussed above, such notification can be made via electronic mail, any type of digital/wireless communications or simply upon accessing the system 200 via a  
25           GUI dialogue box. Thus, the server 404 also communicates with the Web clients 406 via the well-known Secure Multipurpose Internet Mail Extensions (S/MIME) or Simple Mail Transfer Protocol (SMTP) protocols for electronic mail. Also, the server 404, as suggested by FIG. 4, may also communicate directly with the subscribers 408 by any known digital/wireless communication means (e.g., by

pager, telephone, facsimile, cellular telephone, personal digital assistant, etc., possibly running HDML, VoxML, XML, or other similar computer language).

## *VI. System Operation*

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### *A. Marketing*

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Referring to FIG. 5, a flow chart 500 representing an exemplary interaction between a marketing company and system 200 in an embodiment of the invention is shown.

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In a first step 504, the marketing company selects potential loan candidates for a marketing campaign and targets those candidates via direct mailings, TV, print ads, or other similar marketing techniques. In the invention, the potential loan candidates may be targeted based on whether their credit or personal information matches rules predefined by lenders.

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In a step 508, the marketing company then sends the relevant data to system 200. This data may include, in the case of direct marketing, a list of the names of each individual who received a mailing. In the case of TV or print ad campaigns, the data may include a set of criteria which was used to target the market for the campaign. For example, the marketing company may have decided to target individuals between the ages of thirty and forty, and with an annual gross income of greater than \$75,000. In this case, the TV and print ads would appear on programs or in newspapers and magazines typically seen by people that fit these criteria.

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In step 510, the relevant data from the marketing company is translated into an appropriate processing format for system 200 using a Data Transformation and Mapping (DTM) process. The DTM process is further discussed below with reference to FIGS. 25 and 26.

In a step 512, system 200 collects information from loan applicants. This data may come from different sources. For example, the loan applicant may enter the data directly into system 200 by applying for a loan via workstation 280b. Alternatively, a loan agent at the loan origination subsystem 240 may enter the data into system 200 based on the information collected from the applicant via loan origination interface 243 taken over the phone. In the latter case, the collected loan origination information is uploaded from subsystem 240 to system 200 at pre-determined intervals. In one embodiment, this upload occurs once daily. This loan applicant information may include, for example, the loan applicant's name, address, age, annual or monthly gross income, how the applicant heard about the particular loan product, and whether the loan applicant's loan was approved.

In a step 516, system 200 correlates or matches the loan applicant information with the candidate information from the marketing company to generate response data, which indicates those applicants who responded as a result of the marketing company's campaign. This response data is sent back to marketing subsystem 230 via router 262a and archived in database 231.

In a step 518, system 200 uses the DTM process to send the correlated response data to the Marketing company in a preselected format. The DTM process is discussed below with reference to FIGS. 25 and 26.

In a step 520, the marketing company retrieves the response data from database 231 of subsystem 230, and uses this response data in step 504 to develop the next set of criteria to use to target potential candidates. The response data may be uploaded from loan origination subsystem 240 via router 262a and into database 231 at regular intervals. In one embodiment of the invention, upload of this response data occurs once daily.

This type of marketing information is also valuable for reselling and/or cross selling to particular borrower. As such, the system of the invention also archives the marketing data and borrower information.

### ***B. Loan Origination***

Referring to **FIG. 6**, a flow chart 600 representing an exemplary interaction between a loan originator and system 200 in an embodiment of the invention is shown.

In a step 604 of flow chart 600, a loan agent at the loan originator obtains loan application data from a potential borrower. This data can be obtained by the loan agent via system 200. For example, if the potential borrower applies for the loan on-line, at the system web site, system 200 will then notify the loan originator of the loan application and may download the loan application data to loan origination subsystem 240 for processing. Alternatively, the loan application data may be obtained by the loan agent via a call center, in which the applicant calls into the call center and provides his information to the loan agent over the telephone. In this case, the loan agent may enter the loan application data via loan origination interface 243 for subsequent uploading to system 200.

Before the loan information is received by system 200, the information is translated into the correct processing format using the DTM process which is discussed below in **FIGS. 25** and **26**.

**FIGS. 7-14** show exemplary Graphical User Interfaces (GUIs) of an embodiment of a loan origination system for use by a loan agent when interfacing with system 200. In a preferred embodiment of the invention, these GUIs are used on the loan agents' workstation, shown as loan origination interface 243.

As shown in **FIG. 7**, a loan agent, Tom Smith, has a personal account on system 200, in which his current loan application data is stored. A GUI 702, shown in **FIG. 7**, includes a window 704 to display the primary applicant's name, the loan request amount and the status of the loan application. GUI 702 also provides the loan agent with a loan summary window 706 to display detailed information for each pending loan application. Each time a new loan application is initiated, the application is added to the loan agent's account.

As shown in **FIG. 8**, to originate or update a loan application, system 200 provides the loan agent with a GUI 802 that is divided into six separate screens, noted by the tabs 804, 806, 808, 810, 812 and 814 across the top of GUI 802. These tabs are labeled Personal, Employment, Property, Credit Report, Loan and Stipulations, respectively.

A GUI 816 corresponding to tab 804 is shown in **FIG. 8**. GUI 816 permits the loan agent to input each loan applicant's personal information directly into loan origination interface 243. Examples of such personal information include the applicant's name, social security number, phone numbers, date of birth, addresses (current and previous) and nearest relative.

A GUI 904 corresponding to tab 806 labeled "Employment" is shown in **FIG. 9**. GUI 904 permits the loan agent to input each loan applicant's employment information directly into loan origination interface 243. Examples of such employment information include the name of the applicant's primary and secondary or previous employers, the applicant's job title, time at the job, supervisor, phone numbers, and income. An arrow 908 at the lower right corner of GUI 904 allows the loan agent to easily flip between the GUIs for each tab. Further, a loan status bar 912 at the top of GUI 904 depicts a graphical representation of the status of the loan application. Each of the GUIs shown in **FIGS. 7-14** have a similar loan status bar 912.

A GUI 1004 corresponding to tab 808 labeled Property is shown in **FIG. 10**. GUI 1004 permits the loan agent to input information about the loan applicants' property directly into loan origination interface 243. Examples of such information include the property address, property type, taxes, insurance costs, HOA dues and estimated value of the property. Additional tabs 1008 and 1012 at the lower left of GUI 1004 can be used to access additional GUIs (not shown) to input information regarding any liens on the property and the appraisal information for the property.

Referring to **FIG. 11**, a GUI 1104 corresponding to tab 810 labeled Credit Report is shown. GUI 1104 permits the loan agent to access summary information about each loan applicant's credit score from system 200. In one embodiment of the invention, the information relating to credit score is downloaded directly from a credit reporting agency via credit bureau frame cloud 268. Additional tabs 1108, 1112, 1116, 1120 and 1124 appear at the lower left of GUI 1104. Tab 1108 can be used to access an additional GUI (not shown) which includes more detailed information on the applicant's credit score. Tab 1112 can be used to access an additional GUI (not shown) which includes information relating to the credit information for a joint applicant. Tab 1116 can be used to access an additional GUI (not shown) which includes information relating to the loan application. Tab 1120 can be used to access an additional GUI (not shown) which includes information relating to the applicant's spouse's credit report. Tab 1124 can be used to access an additional GUI (not shown) which includes information relating to any inquiries that need to be made to confirm certain loan application information.

Referring to **FIG. 12**, a GUI 1204 corresponding to tab 812 labeled "Loan" is shown. GUI 1204 permits the loan agent to input and access information about the loan directly into and from loan origination server 242. Examples of loan information which may be input by the loan agent, include amount requested, term, rate, loan type, points, loan to value ratio. Examples of loan information which are supplied by loan origination server 242 include, FICO Score, income/debt ratio, disposable income, and savings and payment information. An additional tab 1208 appears at the lower left of GUI 1204. Tab 1208 can be used to calculate loan fees associated with the applicant's loan.

Referring to **FIG. 13**, a GUI 1304 corresponding to tab 814 labeled Stipulations is shown. GUI 1304 permits the loan agent to set certain stipulations relating to the loan directly into system 200. Common stipulations appear in a window 1308 on the left side of GUI 1304. Examples of such common



stipulations include a requirement that for approval, the loan agent must obtain tax returns and W2 forms of the applicant for the past two years. Buttons 1312 and 1316 in the middle of GUI 1304 allow the loan agent to add and remove stipulations from the list in window 1308. An additional tab 1320 appears at the lower left of GUI 1304. Tab 1320 can be used to track the stipulations to mark when all of the stipulations have been met.

Referring to FIG. 14, a GUI 1404 shows an interface that can be used by the loan agent to search the marketing database for preliminary applicant information. When a loan agent receives a call from an applicant, the marketing database can be searched, using, for example, the applicant's last name and zip code, as shown in windows 1408 and 1412, or using a priority code, as shown in a window 1416, to match the applicant with the pre-existing information in the marketing database. The search results are displayed in a window 1420. As shown in FIG. 14, depending on the detail of the search information, more than one match may appear in window 1420. The particular applicant's name is then highlighted, and the applicant information for that applicant is displayed to the right of window 1420. When the user depresses a button 1424, labeled "Qualify", the selected applicant's information is automatically entered into GUI 704 so that the loan agent must only verify this information and does not need to manually re-enter this information, thereby saving time.

Returning now to FIG. 6, in a step 608, the loan originator requests a credit report from a credit reporting agency. In the embodiment shown in FIG. 2, this request is sent to the credit reporting agency via credit bureau frame cloud 268. System 200 is configured so that the information obtained from the credit agency is automatically entered into the proper cells in graphical user interfaces of the system.

In a step 612, the loan originator may consult with portfolio subsystem 220 or trading subsystem 210 for market data relating to the types of loans currently in demand and the predefined rules for wholesalers relating to loan

purchase. The information obtained by the loan originator is processed in exchange system 200 standardized XML format used by the DTM process as referenced below in FIGS. 25 and 26. This will enable the loan originator to know which types of loans to originate, and which types of borrowers look most attractive to the mortgage bankers.

In a step 616, the loan agent then evaluates the applicant's loan information, including credit score, and determines whether to pre-approve the applicant's loan request.

If the loan is not approved, loan application information is archived in a loan application data warehouse of system 200, as shown in a step 620. In the embodiment of the invention shown in FIG. 2, the loan application data warehouse includes, for example, databases 204a, 204b, 226 and 231. As would be apparent to one skilled in the relevant art(s), the loan application data warehouse is a collection of databases, and provides programming logic to allow a user to access all of the data in the databases at the same time. Returning now to FIG. 6, the applicant is then notified that the loan was declined, as shown in a step 624 and the interface between the loan originator and system 200 ends at a step 648.

If the loan is pre-approved, the loan application data is sent to the loan processor for processing and then to the underwriter for final approval, as shown in a step 632. There are similar GUIs (not shown) available through workstation 243 of loan origination subsystem 240 for use by the loan processors and underwriters to process and approve the loan.

In a step 636, the manager of the loan origination company then determines, using workstation 246, whether to give final approval to the applicant's loan request. If final approval is denied, the loan application data is archived in origination archive 226 of the loan application data warehouse, in step 620 and the flow follows as described above. If the loan is given final approval, the loan originator and application proceed through loan closing in a step 636 and

funding is provided to the loan applicant in a step 640. Similar GUIs (not shown) are available through system 200 for use in loan closing step 636.

In a step 644, the loan application data for the approved loans is sent to system 200 to be archived in origination archive 226 of the loan application data warehouse, and the interface between the loan originator and system 200 ends at step 648. As explained above, in one embodiment, the loan application data, including both data for approved and unapproved loans, is uploaded to origination archive 226 once daily.

### C. *Exchange System 200*

A person wishing to sell a loan or loan pool may access exchange system 200 via workstation 280d to publish a loan or loan pool for sale. In the case of a loan pool, the seller may first access system 200 via workstation 280f to create the loan pool. Workstation 280f can be used to search currently available loans for a seller using certain predetermined criteria (e.g., FICO score, loan amount, loan term, CRA compliance, etc.) to generate a pool of loans satisfying the search criteria. This pool can then be saved and stored in databases 221 and 222 of portfolio subsystem 220.

**FIG. 15A** is an example of bulk trading; however, the same system could be used for trading of a single loan. As shown in **FIG. 15A**, a seller wishing to sell a loan or loan pool sends the loan information to the exchange system in step 1502.

In step 1504, before being forwarded to the exchange system, the loan information to be published by the seller undergoes a translation using a DTM process or other translation process. Translation products that may be used to implement this translation process include: Data Junction™ by Data Junction Corporation, DTS™ by Microsoft SQL Server. The DTM process of the present invention is described below with reference to **FIG. 25**.

5 In step 1506, the loan information is published for sale on exchange system 200. The seller can publish the loans either by entering the loan information manually or uploading via workstation 280d or retrieving the loan information from origination archive 226 or databases 221 and 222 of portfolio subsystem 220.

10 In one embodiment, subscribers each have a profile archived in system 200. The profile includes the subscriber's contact information, such as, the name of the company for which the subscriber works, the subscriber's telephone number(s), fax number(s), address information and electronic mail address information. The profile also includes a list of all loans or loan pools that have been published by the subscriber for sale in system 200. Other subscribers can access this profile information for review. The subscriber can also access his own profile to update the information therein.

15 In one embodiment, the subscriber can set up his rules for his profile using the loan criteria to indicate the conditions under which the subscriber wishes to be notified by the system of a published loan or loan pool. The subscriber may mark these predefined rules to be public, available to all subscribers for review, or private, not accessible to other subscribers. Further, the subscriber may opt to have sensitive loan data, such as social security numbers and name, removed until  
20 the loan undergoes the due diligence process. In addition, the subscriber may opt to add expiration dates to offers, associate a particular "settle by" date, or have fees calculated automatically with bids.

25 After the loan(s) are published, exchange system 200 will test the loan information against the preselected rules for its registered buyers applying a Rule Based Filter (RBF), as shown in a step 1508. The RBF is made up of standard and special components. The standard component comprises basic logic checks and rules established by the database operator. For example, the system may check to ensure that the loan amount is within a certain value range, or check the number of digits within the social security number. The special component is

comprised of user-defined rules which are typically applied in flow trading. For example, the user can specify that all LTV ratios above 100 should be blocked.

If the loan survives a particular buyer's filter, exchange system 200 may notify the buyer or buyers of the publication of the loan(s), as shown in a step 1512. This notification can occur in a variety of ways, depending on the buyer's notification preference. For example, the exchange system 200 might send an automatic electronic mail, telephone call, facsimile, or page to the buyer with notification that a loan has been added that meets the buyer's criteria and advising the buyer to check the Web site via workstation 280d. Such notifications can be sent via electronic mail, pager, telephone, facsimile, cellular phone, or hand-held computer.

In addition, the buyer can set up the account to monitor and "push" trading activity information to the user's computer screen-saver or window without having to be logged into the exchange system 200. This process of "pushing" uses the concept of instant messaging to listen for messages from the server and send notification of message to the subscriber's screen. In one embodiment, when the subscriber logs onto system 200, he receives a "buy alert" that displays new loans or loan pools that have entered the system 200 and that meet the subscriber's predefined rules. Also, while the subscriber is logged into his account on system 200, a "buy alert" may flash on the subscriber's computer screen if a new loan or loan pool meeting his predefined rules enters the system.

In one embodiment, a trading company profile may also be provided. If a subscriber is interested in a particular loan pool, he can use the trading company profile to find out information on the company that published the loan pool. This profile can include information such as contact information and contact persons at the trading company, years in business, net worth, financial product offerings, monthly loan volume and so on.

If the loan does not meet any of the buyers' preselected rules, notification step 1512 is skipped and the loan remains published on exchange system 200. The

buyer can access the loan information via workstation 280d. In one example, a GUI 1804 is provided to the buyer, as shown in FIG. 18.

5 GUI 1804 presents information on each loan in the loan pool offered for sale to the buyer and allows the buyer to search the loan pool using certain criteria. For example, as shown in a GUI 2204 of FIG. 22, the buyer could search the loan pool for all loans with a FICO score greater than 639. Those loans meeting the selected criteria would be automatically accepted, while all other loans would be declined. The user can also manually accept, decline or suspend individual loans in the pool, using pull down arrow 1808 of GUI 1804. In one  
10 embodiment, the data in GUI 1804 is provided in a Microsoft Excel spreadsheet format. In order to decide whether to accept a particular loan, the buyer can also review more specific details on each loan in the pool, as shown in a GUI 2104 of FIG. 21.

As shown in the lower left of GUI 1804 there are two tabs 1812 and 1816.  
15 The tab 1812, labeled "Detail" displays the information shown in FIG. 18. The tab 1816, labeled "Summary" displays the summary information shown in FIG. 19 in a GUI 1904.

The summary data is divided into three windows 1908, 1912 and 1916, which display information for all accepted, declined and suspended loans from the loan pool in FIG. 18. This allows the buyer, after performing a search of a loan  
20 pool, to use the summary information to determine what type of offer to make for the remaining, accepted loans from the pool.

In one embodiment, summary information on a pool can also be displayed using graphs, such as bar charts, pie charts, and similar graphs, and stratification reports, which are a break down of the data points in a particular category. For  
25 example, a graph of the distribution of all loans in a pool by FICO score may be used to graphically characterize a loan pool. The user will be able to determine how many loans in a pool fall within a particular FICO range. A similar graph can be generated after the buyer performs a search to show only those loans that meet

the search criteria. The summary may also include information such as weighted averages of FICO score, loan term, loan rate, combined loan-to-value ratio, and debt ratio of the loans in the pool. This information can be generated both before and after a buyer performs a search.

5           Returning now to FIG. 15A, step 1516 represents when a buyer makes an offer for a loan or loan pool. The buyer can enter his offer via workstation 280d. Exchange system 200 archives all offers made in database 203a, as shown in a step 1520. This information is subsequently used to calculate market prices for different types of loans, which includes fixed, adjustable, and balloon mortgages as well as first-lien (sub-prime, jumbo, conforming) and second-lien (sub-prime, home equity, home non-equity, Title I) products. Offers made by a subscriber can be canceled at any time before a final agreement is reached.

10           The seller who published the loan(s) is then notified by exchange system 200 that an offer has been made, as shown in a step 1524. Notification can be effected to the seller in any of the same manners as discussed above with respect to step 1512. Alternatively, the seller may have a personal account in exchange system 200 that he periodically checks. Exchange system 200 may notify the seller of incoming offers simply by posting the offer to the seller's account. In an embodiment, the seller may be able to receive notification in multiple locations, and respond to the notification via the same method in which the notification was received. For example, if the subscriber receives notification by pager, then the subscriber can send a message back on the pager to accept or decline the offer.

15           As shown in a decision step 1528, the seller must then decide whether to accept or decline the offer or whether to make a counteroffer. If the offer is declined, the flowchart continues in FIG. 15B.

20           As shown in a step 1532 of FIG. 15B, exchange system 200 archives the declined offer in database 203a. This information is also used to calculate market prices for loans.

In a step 1536, exchange system 200 notifies the buyer that his offer has been declined, and queries, as shown in a step 1540, if the buyer has another offer. If the buyer does not make another offer, the flow ends at a step 1544. If, however, the buyer makes another offer, the flow returns to **FIG. 15A**, at step 1520, which archives the second offer in exchange system 200, checks to see if the loan is still available and notifies the seller of another offer.

Returning to decision step 1528, if the seller makes a counteroffer to the buyer, the flow continues to **FIG. 15C**. The seller's counteroffer is archived in database 203a of trading subsystem 210, as shown in a step 1548. The buyer is then notified of the counteroffer as discussed above, as shown in a step 1552.

The buyer then must decide whether to accept or decline the counteroffer or make a second counteroffer, as shown in a decision step 1556. If the buyer makes a second counteroffer, exchange system 200 returns to step 1520 in **FIG. 15A**. The buyer's counteroffer is archived in exchange system 200 and continues as described above.

If the buyer declines the counteroffer, exchange system 200 archives the declined offer in database 203a, as shown in a step 1560. This information is used by exchange system 200 to calculate the market value of loans. In a step 1564, exchange system 200 notifies the seller of his declined counteroffer and inquires if the seller would like to make another offer, as shown in a step 1568. If no further offer is made by the seller, the flow ends at a step 1572. If another offer is made by the seller, the flow returns to step 1548 at the top of **FIG. 15C**.

Referring back to steps 1528 and 1556, if the seller accepts the original offer or the buyer accepts the seller's counteroffer, the flow then continues as shown in **FIG. 15D**. As shown in block 1576, the accepted offer is archived in database 203a of trading subsystem 210. This information is used by exchange system 200 to calculate the market prices for loans. Exchange system 200 then notifies the buyer or seller, depending on who made the last offer, of the accepted offer as discussed above and as shown in a step 1580.



In one embodiment, a bid summary is provided, as shown in a GUI 2304 of FIG. 23. This summary includes the original asking price and detail information on the loans in the pool, as shown in a box 2308. Counteroffer information is provided in a box 2312. The status of the bid is displayed in a box 2316. For example, as shown in FIG. 23, the buyer's counteroffer has been accepted. The buyer may then be given the option to withdraw the offer or confirm acceptance.

As shown in FIG. 24, the subscriber may also be provided with a GUI 2404 that summarizes the subscriber's buying and selling activity. GUI 2404 shows an example of the subscriber's buying activity. In a box 2408, the pools on which the subscriber has bid are shown. Information on the pool, including the pool number, date of posting, seller and asking price are displayed. Further, the bid information is shown, including the bid price, buyer's name, number of loans accepted, declined or suspended, and offer date. Finally, the status of the bid is displayed. This provides the subscriber with a summary of the up-to-date status of his trading activity. Further, in a box 2412, the subscriber's past trades can be summarized.

Returning now to FIG. 15D, once terms of a trade are agreed upon, exchange system 200 checks to see if the buyer has pre-registered with a trust company, as shown in a block 1584. When a buyer typically purchases a loan, the sale is contingent upon the buyer conducting a due diligence investigation on the loan file or a statistical sampling of loan files, if a pool of loans is purchased. If the buyer has not pre-registered with a trust company, then the files are transferred to the buyer or the buyer's choice in step 1586. After the initiation of step 1586, the flow ends at a step 1588. However, if the buyer is pre-registered, system 200 initiates a transfer of the purchased loan files to the designated trust company, as shown in a step 1592. The interaction between system 200 and the trust company is discussed in further detail below with reference to FIG. 16.

***D. Trust (Due Diligence)***

As shown in **FIG. 16**, system 200 notifies the trust company of incoming loan files in a step 1604. This notification can occur in several ways. For example, system 200 can notify the trust company via a letter, electronic mail, or other notification methods discussed herein.

System 200 further requests that the seller transfer the loan files directly to the trust company, as shown in a step 1608. As such, the buyer does not have to oversee this file transfer. This notification can be done simply by sending an electronic mail to seller, when the sale is completed, with the name and mailing address or electronic mail address of the trust company.

A hard copy of the loan files may be physically transferred via mail, courier or similar means to the trust company for review. In an alternate embodiment, the contents of the loan file are scanned and an electronic file containing the scanned documents is forwarded to the trust company via an electronic connection.

Then, independent of system 200, the trust company performs its due diligence review of the actual loan file, as shown in a step 1612. The dashed line in **FIG. 16** represents that this step is being performed at the trust company site, outside of system 200. In another embodiment, the seller can transfer a loan file to the trust company prior to posting the loan on the exchange system for sale. The trust company would perform a due diligence analysis of the loan documents. If the loan passed the due diligence inspection, then the seller could mark the loan as certified on the exchange system.

Once the trust company completes its review of the loan files, it notifies this buyer whether the loans were certified, as shown in a step 1616. This notification is sent to system 200 via workstation 280c and may also be communicated directly by the trust company to the buyer.

If the loans are certified, as shown in a decision step 1620, the trust company transfers the loan files to the buyer or directly to the buyer's servicing

company or loan file custodian, as shown in a step 1624. In one embodiment, system 200 may provide the trust company with notification of where to send the certified loan files via workstation 280c. For example, when the trust company notified system 200 that the loan files were certified in step 1616, system 200 may be programmed to automatically provide information to the trust company on where the loan files are to be sent. After this transfer has occurred, this interaction ends in a step 1628.

If the loans are not certified, the loan files are returned by the trust company to the seller, as shown in a step 1632 and the interaction ends in a step 1636. As would be apparent to one skilled in the relevant art, in an alternate embodiment, the loan files that are not certified could be forwarded to the seller's designee, e.g., loan file custodian.

### *E. Servicing*

Once a loan or loan pool has been purchased by a buyer having a pre-registered servicing company, system 200 initiates a transfer of loan information to the servicing company via servicing gateway 250, as shown in a step 1704. This process is called "servicing released" in which both the loan(s) and servicing rights are sold together. However, in some circumstances, the seller may choose to sell the servicing rights to a loan or loan pool separate from the loan. In this case, referred to as "servicing retained", the selling of the servicing rights to a loan or loan pool would be handled by system 200 in the same manner as discussed in FIGS. 15A-15D with respect to sales of loans. As such, the seller would publish the servicing rights to the loan or loan pool for sale, as shown in step 1506. The process for selling the servicing rights separately would continue as with the posting and selling of a loan. Thus, for example, in step 1704, exchange system 200 would transfer the information to the servicing company that purchased the servicing rights of a loan or loan pool.

Returning to FIG. 17, the servicing company uses loan information provided by system 200 to send out coupon booklets or monthly invoices, as shown in a step 1708. The servicing company then monitors the borrowers monthly payments and archives history payment information. For example, the servicing company will store information indicating whether the borrower made a monthly payment on time.

If a payment is overdue, as shown in a decision step 1712, the servicing company decides what action is required, in a step 1716, such as filing a claim in bankruptcy, or filing a claim in court for overdue payments. Often, the servicing company will place several calls to the borrower to resolve any overdue payments before filing claims.

The servicing company can access system 200 via workstation 280h to periodically forward this payment history information back to the system 200 as shown in a step 1720. In particular, the servicing company sends servicing information back to system 200 via servicing gateway 250 to update the system. In one embodiment, this updating occurs nightly, however, it would be apparent to one skilled in the relevant art(s), that such updates could occur more or less frequently, as desired.

Many servicing companies employ mortgage service software such as the Mortgage Servicer Systems software available from Financial Industry Computer Systems (FICS) Group of Brussels, Belgium. The invention interfaces with such software to facilitate upload and download information from servicing gateway 250 to and from system 200.

#### ***F. Securitization***

As shown by a block 320 in FIG. 3, the investors can access system 200 via workstation 280e look for loan pools for sale by mortgage bankers to purchase. Using trading subsystem 210, investors can make bids on loan pools

for sale on the system 200. The investors then use collections of these purchased loan pools to create mortgage-backed securities, as discussed in detail above. The investors can publish these mortgage-backed securities on system 200 via workstation 280e for sale to interested buyers.

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### *G. Brokerage*

As explained above, brokerage firms may be employed by the investors to find buyers for the mortgage-backed securities. As shown by a block 324 in FIG. 3, these brokerage firms can access system 200 via workstation 280g to find out risk-return statistical information about the loans in the loan pool, that is being used to back the mortgage-backed security. Further, the brokerage firms can access information from system 200 via the workstation 280h to find out payment history information for the loans in the loan pool.

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### *H. Credit Rating*

As shown by a block 336 in FIG. 3, a credit rating agency, typically hired by the brokerage firm to rate a mortgage-backed security, can access system 200 to review the payment history and risk-return information in system 200 in order to rate a particular security. For example, the credit rating agency can review the payment history of the loans used to back a particular mortgage-backed security, to determine whether the loans are likely to be prepaid or go into default.

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### *I. Risk/Return*

A risk-return module, represented by risk-return interface 332 in FIG. 3, is accessed via workstation 280g and is meant to provide the subscriber with quality control and risk analysis data as they use the exchange system 200 in their

decision-making processes. In one embodiment, the risk-return module includes, for example, one or more of the following calculations typically known and used by one skilled in the relevant art to make a determination of risk associated with a particular loan or loan pool: prepayment calculations on a loan or loan pool, duration calculations on a loan or loan pool, convexity ( $\gamma$  distribution), vega, derivative with respect to total prepayment, housing turnover, refinancing, conditional prepayment rate (CPR), option adjusted spread (OAS), value at risk (VAR), cash flow, total rate of return, price/yield calculations, and scenario builders for cash flow analysis.

In one embodiment, the risk return module further includes an index of trade data from live transactions or trades that occur over the exchange system 200. This trade data may include, for example, volume of trades, weighted average coupon, average combined loan-to-value ratio, average FICO score, average term of loan, average rate and average debt ratio.

The risk return module may also incorporate other data points from externally running subsystems such as, but not limited to, the loan origination subsystem 240 and servicing subsystem 250. The risk-return module is designed to be very flexible in nature. This means that all processes read initialization files (\*.ini) upon starting to set parameters. Command line arguments and GUI methods of setting variables during execution are also important functions.

The data contained in the risk-return module is important because it is shared across many different subsystems within exchange system 200. As outlined below, reports and visualizations, such as graphs, of data in the risk return module are provided for the subscribers. Through operation of the system 200 over time, the data in the risk return module allows for predictive modeling. The purpose of the risk return module is to use collect the data over time to build dependence from subscribers on the system 200 so that full trade-based decisions can be made based on the data available to the users in the risk return module, similar to data relied on by individuals involved in transactions on Wall Street today.

Neural-network technology can be used in the risk-return module. The network will train off of real-time trades that are occurring in trading subsystem 210 within the exchange system 200. The data in the risk-return module evolves over operation time of the system 200. Thus, as will be apparent to one skilled in the relevant art(s), necessary measures within the risk-return module must be taken in order to protect and secure the data used within it.

There is also statistical and scientific analyses conducted within the risk-return module. The results of these analyses are presented to the user in the form of graphs and other visualizations of the data. These graphs and other visualizations are more easily used by the subscribers than massive numerical reports. Massive reports can also be provided, however, to illustrate those details of the calculations that may not be readily apparent from the visualizations of the data.

In one embodiment of the invention, the risk-return module provides a graph similar to a NAV-type graph that is time focused, such that it correlates time with some value that changes over time. In the invention, this variable is often focused around money (*e.g.*, volume of trades, value of trades, etc.). While time will be on one axis, the other axis will contain sellers or buyers. As such, a subscriber will be able to peruse (at-a-glance) what other companies within the exchange system 200 are doing.

In an embodiment of the invention, an index of the risk return module includes graphs of the following information: (1) single company number of trades over time; (2) multiple company number of trades over time; (3) volume of trades on the trading system over time; (4) total number of bids and sells over time; and (5) changes in company criteria over time. The preceding listing of graphs is provided by way of example only. It would be apparent to one skilled in the relevant art(s) that graphs depicting the change over time of other types of data may be useful as a predictor of risk.

In one embodiment, access to the risk-return module is provided over a secure public-key cryptosystem web connection (*e.g.*, SSL). As such, the risk return module functions are limited to a service-based environment along with the actual trading platform (*i.e.*, subsystem 210). This configuration allows for quick updates, and immediate updating with new functionalities. This is particularly important to the exchange service provider organization because it may test different prediction algorithms and the like, as they are discovered/developed, and the ability to swap and make new algorithm outputs available to subscribers in short order is needed.

The risk-return module interfaces with the following subsystems (as described in FIG. 2 above), each with their own unique data repository: loan origination subsystem 240, trading subsystem 210, portfolio subsystem 220, and boarding relay server 225 conduit. Boarding relay server 225 conduit is a secure transport and relay mechanism that exists at the exchange system 200. The data that is piped through boarding relay server 225 conduit will be archived and usable by analyses processes of the risk return module. In one embodiment, this conduit is based in part on the open eXtensible Markup Language (XML) specification maintained by the World Wide Web Consortium (W3C), whereby many other potential processes are able to read these files during integration with one of the several (freeware) publicly available XML/DTD parsers.

In one embodiment, the risk-return module collects and presents data on the valuation of the Treasury Bill (T-Bill) from Wall Street. As more trades occur over the system 200, and more subscribers use the system 200, the data in the risk return module becomes an even more valuable predictor of risk.

The invention also may include a "ticker-tape" visualization of certain data in the risk return module. "Splash" or message screens can be utilized in the beginning of the exchange system 200 operation (*i.e.*, as the data repositories are ramping up). These presentation formats can be used to highlight a certain subset



of data points in real-time. Examples of such data include mean trade value, total volume of trades, etc.

The data within the risk-return module will be in a number of file formats, including, for example: flat file (XML), Relational Database Systems (RDBMS), and Object Database Systems (ODBMS). The system utilizes “adapters” to these different data repositories, and reuses them across all data repositories of that type.

## *VII. Environment*

The invention (i.e., exchange system 200 or any part thereof) may be implemented using hardware, software or a combination thereof and may be implemented in a computer system or other processing system. In fact, in one embodiment, the invention is directed toward one or more computer systems capable of carrying out the functionality described herein. An example of a computer system 2000 is shown in FIG. 20. The computer system 2000 includes one or more processors, such as processor 2004. The processor 2004 is connected to a communication infrastructure 2006 (e.g., a communications bus, cross-over bar, or network). Various software embodiments are described in terms of this exemplary computer system. After reading this description, it will become apparent to a person skilled in the relevant art(s) how to implement the invention using other computer systems and/or computer architectures.

Computer system 2000 can include a display interface 2005 that forwards graphics, text, and other data from the communication infrastructure 2002 (or from a frame buffer not shown) for display on the display unit 2030.

Computer system 2000 also includes a main memory 2008, preferably random access memory (RAM), and may also include a secondary memory 2010. The secondary memory 2010 may include, for example, a hard disk drive 2012 and/or a removable storage drive 2014, representing a floppy disk drive, a

magnetic tape drive, an optical disk drive, etc. The removable storage drive 2014 reads from and/or writes to a removable storage unit 2018 in a well-known manner. Removable storage unit 2018, represents a floppy disk, magnetic tape, optical disk, etc. which is read by and written to by removable storage drive 2014. As will be appreciated, the removable storage unit 2018 includes a computer usable storage medium having stored therein computer software and/or data.

In alternative embodiments, secondary memory 2010 may include other similar means for allowing computer programs or other instructions to be loaded into computer system 2000. Such means may include, for example, a removable storage unit 2022 and an interface 2020. Examples of such may include a program cartridge and cartridge interface (such as that found in video game devices), a removable memory chip (such as an EPROM, or PROM) and associated socket, and other removable storage units 2022 and interfaces 2020 which allow software and data to be transferred from the removable storage unit 2022 to computer system 2000.

Computer system 2000 may also include a communications interface 2024. Communications interface 2024 allows software and data to be transferred between computer system 2000 and external devices. Examples of communications interface 2024 may include a modem, a network interface (such as an Ethernet card), a communications port, a PCMCIA slot and card, etc. Software and data transferred via communications interface 2024 are in the form of signals 2028 which may be electronic, electromagnetic, optical or other signals capable of being received by communications interface 2024. These signals 2028 are provided to communications interface 2024 via a communications path (*i.e.*, channel) 2026. This channel 2026 carries signals 2028 and may be implemented using wire or cable, fiber optics, a phone line, a cellular phone link, an RF link and other communications channels.

In this document, the terms "computer program medium" and "computer usable medium" are used to generally refer to media such as removable storage

drive 2014, a hard disk installed in hard disk drive 2012, and signals 2028. These computer program products are means for providing software to computer system 2000. The invention is directed to such computer program products.

5 Computer programs (also called computer control logic) are stored in main memory 2008 and/or secondary memory 2010. Computer programs may also be received via communications interface 2024. Such computer programs, when executed, enable the computer system 2000 to perform the features of the invention as discussed herein. In particular, the computer programs, when executed, enable the processor 2004 to perform the features of the invention.  
10 Accordingly, such computer programs represent controllers of the computer system 2000.

In an embodiment where the invention is implemented using software, the software may be stored in a computer program product and loaded into computer system 2000 using removable storage drive 2014, hard drive 2012 or  
15 communications interface 2024. The control logic (software), when executed by the processor 2004, causes the processor 2004 to perform the functions of the invention as described herein.

In another embodiment, the invention is implemented primarily in hardware using, for example, hardware components such as application specific  
20 integrated circuits (ASICs). Implementation of the hardware state machine so as to perform the functions described herein will be apparent to persons skilled in the relevant art(s).

In yet another embodiment, the invention is implemented using a combination of both hardware and software.

### ***VIII. Data Transformation and Mapping Process***

The Data Transformation and Mapping (DTM) process is a method used by exchange systems 200 and 2700 to simplify the transfer of data between the exchange system and subscribers' computer systems. The DTM process allows loan information to be standardized into an eXtensible Markup Language (XML) processing format which is a standard maintained by the World Wide Web Consortium (W3C). Before transferring data information back to the user, the DTM process can be used to translate the XML format into a user's predefined format when different from the XML standard. This DTM process eliminates the need for subscribers to create customized adaptations between different subscriber systems. For example, the seller no longer needs any proprietary communications expenditures to do proprietary business with a particular buyer. At the same time, the buyer's receipt of loans from many sellers is simplified and streamlined.

**FIG. 25** is a flow diagram illustrating the DTM process and the data flow and formatting between exchange system 2700 and the subscriber. **FIG. 25**, as illustrated, is an example of flow trading where the exchange system 2700 functions as a correspondent delivery system.

As shown in **FIG. 25**, a correspondent subscriber uploads loan data into system 2700 in step 2502.

In a step 2504, before the loan data that was input by the correspondent subscriber is forwarded to exchange system 2700, the data undergoes a transformation using the DTM process to ensure that the data is in the correct, standardized processing format for the exchange system. In this transformation, the DTM process takes the individual pieces of loan data and ensures that the position and formatting of the information is in a standardized form. This processing includes the application of a preliminary, standard rules based filter, as discussed further below. For example, in the marketplace, there may be subtle differences in the way that the appraisal value of a property is determined. The

DTM process is able to compensate for these differences and standardize loan data entries into a single format, such as XML.

5 In FIG. 26, the DTM process is illustrated where X, Y, and Z represent various pieces of loan information. For example, assume X=LTV, Y=Social Security Number (entered with dashes), and Z= FICO. For entry into exchange system 2700, it may be necessary to have the X and Z values in a different position, and the Y value displayed without dashes. The DTM process would transform the data in the standardized form as shown in the XML column of FIG. 26. After the loan information has been processed in exchange system 2700, the  
10 DTM process sends the data to the Buyer in the XML-format or in the Buyer's predefined format, if preferred by the Buyer.

Returning to FIG. 25, in a step 2506, the XML-formatted data is received and processed by exchange system 2700.

15 In a step 2508, the processed loan data is again translated using the DTM process into a pre-defined format for a particular buyer, if different from the standard XML format.

In a step 2510, a Rules Based Filter (RBF) is applied to the translated data. The RBF is made up of 2 components: (1) a standard and (2) customized filter. The standard filter component comprises basic logic checks and rules which  
20 are established by the exchange system 200. For example, the system may need to determine whether the interest rate been entered with two decimal places. The customized filter component is comprised of user-defined rules or criteria.

In step 2512, the processed and re-formatted (if necessary) loan data is transferred to the buyer. The loan data can then be processed by the buyer using  
25 its proprietary backoffice system.

This DTM process and the CDS platform, discussed above with reference to FIG. 28, have several advantages. First, the system shortens the acquisition cycle as data is immediately available for review by a buyer allowing for streamlined processing and faster funding. Second, the system ensures that the

transferred data meets the data requirements of the buyer's backoffice systems. Third, the system can automatically validate submitted loan data against the buyer's own defined purchase criteria to ensure that the loans submitted to the buyer meet the buyer's product guidelines prior to delivery. Fourth, the system reduces costs of maintenance and training required at the buyer and seller. Fifth, the system provides reporting and monitoring to track loan volume and quality, thereby improving correspondent management.

The open platform, discussed above with reference to FIG. 28, also has several advantages. For example, the system allows buyers to expand market share and increase loan acquisition opportunities through development of relationships with new sellers. The system also allows sellers to enhance exit strategies for those loans which they have acquired and want to sell.

### ***IX. Subscriber Tools***

Various subscriber tools may be provided to the subscriber as enhancements of the present invention. For example, a work flow manager tool may be provided that allows a subscriber to assign, set up, and track tasks that need to be accomplished in, for example, settlement on the sale of a loan. The work flow manager tool may also allow the subscriber to notify each party of the assigned tasks.

Another tool that may be provided to the subscriber is a specialized calculator that allows the subscriber to calculate statistical information on a loan or set of loans selected by the subscriber.

Further, a reporting and data mining tool may be provided to enable subscribers to evaluate market data and decide on which loans to make a bid.

A comparison tool allows a subscriber to compare program matrices of various buyers to determine the best price the subscriber may be able to obtain for a loan or loan pool.

*X. Value Added Services*

The present invention may include links to several value added services that can be used by the subscriber to facilitate buying or selling a loan. These value added services include, for example, automated underwriting, automated pricing, rate locking, loan product comparison mapping, credit scoring, credit updates, CRA qualification and appraisal updates.

*A. Automated Underwriting*

Many companies in the business of purchasing loans use an automated underwriting engine which makes decisions on whether to purchase a loan based on predetermined underwriting guidelines. Examples of such decision support engines include, Good Decisions<sup>TM</sup>, a product of GE Capital Mortgage Services, Inc. and AssetWise<sup>TM</sup>, a product RFC Mortgage Services Ltd. In use, the system allows subscribers to select certain loans of interest to check against the decision support engine. Once the loans have been selected, the subscriber clicks or selects a decision support service option on the user interface. A query is then automatically sent to a decision engine resident on the system of the present invention or located on another Web site. The decision engine checks the information for the selected loans against the automated underwriting criteria and renders a decision to the subscriber on whether to purchase the loan. In another embodiment, the subscriber would be able to choose from among a variety of proprietary automated underwriting systems available through links on the exchange system Web site, or the subscriber could select his company's own proprietary automated underwriting engine.

### ***B. Automated Pricing***

Similar to the automated underwriting service, the present invention may also provide a value added pricing service to subscribers. This pricing service would automatically calculate the price for a particular loan based the loan data. This service would be helpful to subscribers selling a loan, who are not sure how to price the loan that they wish to post on the system. This service would also be helpful to subscribers interested in buying a loan, who are not sure how much to offer for the loan.

In use, the system allows subscribers to select certain loans of interest to send to the pricing service. Once the loans have been selected, the subscriber clicks or selects a pricing service option on the user interface. A query is then automatically sent to a pricing engine, either resident on the system of the present invention or linked to another Web site. The pricing engine passes the loan data through a pricing algorithm in order to render a suggested price to the subscriber for each selected loan. Similarly, the pricing service could be used to provide a suggested price on a pool of loans.

### ***C. Rate Locking***

The present invention may also provide a rate locking service. In this service, a subscriber can send a loan to a prospective buyer for sale. If the buyer makes an offer to purchase the loan, the rate locking service will allow the subscriber to accept this offer and lock the price on the system.

### ***D. Loan Product Comparison Mapping***

The present invention may also provide a loan product comparison mapping service. In this service, a subscriber can compare two different loan



products by comparing each loan product to the subscriber's program matrix. In this way, each loan product is mapped against the subscriber's matrix so that the subscriber can more easily compare the different loan products to each other.

5                    *E.      Credit Scoring/Credit Updates*

10                   The present invention may also provide a credit scoring/credit update service. In this service, subscribers can select certain loans of interest. Once the loans have been selected, the subscriber clicks or selects a credit update option on the user interface. A query is then sent a credit service bureau containing up-to-date credit scoring information. This information is then provided, via the system of the present invention, to the subscriber for each of the borrowers on the selected loans. This service may be used before a loan is closed to check the credit score of the loan applicant(s) or it may be used before buying or selling a closed loan to check and update the credit score information for the borrower(s).

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*F.      CRA Qualification*

20                   In the case of the value added service for CRA qualification, a link may be provided to allow the subscriber to check to see how many loans in a particular pool are CRA qualifying.

25                   The Community Reinvestment Act (CRA) is a federal regulation which was designed to encourage depository institutions to help meet the credit needs of the communities in which they operate, including low and moderate income neighborhoods. The Act requires that a certain number of loans which meet CRA criteria be acquired each year. The criteria used to determine possible CRA compliance includes: (1) whether the applicant has low or moderate income and the property is within a certain census tract; (2) whether the applicant has low or

moderate income only; (3) whether the piece of property is on a particular census tract; and (4) whether neither (1)-(3) are met.

In response to the subscribers' need to comply with the CRA, the present invention may flag those loans which would allow the subscriber to fulfill part of their CRA purchase obligations. An independent, third party may be used by the exchange system to verify that the listed loan has met the federal guidelines and is indeed CRA compliant. The advantage to flagging CRA qualified loans is that it provides a centralized and quick tool for institutions to sell or buy these types of loans.

In one embodiment, the system marks or flags the loans appearing on the system as CRA qualified, if applicable. In another embodiment, the system allows subscribers to select certain loans of interest to check for CRA qualification. Once the loans have been selected, the subscriber clicks or selects a CRA option on the user interface. The query is then automatically sent to a CRA engine, either resident on the system of the present invention or linked on another Web site, which checks the CRA qualifications for the selected loans and returns a response to the subscriber on the status of each loan.

#### *G. Appraisal Updates*

Another value added service that may be provided to subscribers on the present invention is an appraisal service. In this service, subscribers can select certain loans of interest. Once the loans have been selected, the subscriber clicks or selects an appraisal option on the user interface. A query is then sent to an appraisal engine and/or database, either resident on the system of the present invention or linked on another Web site, which contains recent appraisal information. Updated appraisal information is then provided to the subscriber for each of the selected loan properties. This service is particularly useful for trading of "seasoned" loans, i.e., loans that were made several years ago such that the

value of the underlying property may have changed since the original appraisal date at the time of closing.

***XI. Conclusion***

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While various embodiments of the invention have been described above, it should be understood that they have been presented by way of example, and not limitation. It will be apparent to persons skilled in the relevant art(s) that various changes in form and detail may be made therein without departing from the spirit and scope of the invention. This is especially true in light of technology and terms within the relevant art(s) that may be later developed. Thus the invention should not be limited by any of the above-described exemplary embodiments, but should be defined only in accordance with the following claims and their equivalents.

**What Is Claimed Is:**

1. A system for exchanging data used in trading financial products in the secondary market, comprising:
  - 5 means for receiving data, including loan information, for trading of a loan(s) from a first subscriber in a first data format;
  - means for translating said data into an exchange system default format;
  - means for applying user-defined filter(s) to said data;
  - 10 means for sending said data from the system to a second subscriber in a format selected by said second subscriber.
2. The system of claim 1, wherein said first subscriber is selected from the group consisting of at least one of the following: a broker, a mortgage  
15 bank correspondent, a servicing company, and a mortgage bank investor.
3. The system of claim 1, further comprising:
  - means for applying a Rule Based Filter (RBF) to said data to perform basic logic checks.  
20
4. The system of claim 1, wherein said exchange system default format is an XML format.
5. The system of claim 1, further comprising:
  - 25 means for flagging said loan information which contains Community Reinvestment Act (CRA) qualifying mortgages.

6. The system of claim 1, further comprising:  
means for enabling the user to select fee calculations automatically.
- 5 7. The system of claim 1, further comprising:  
means for generating transaction logs of account and trading activity.
8. The system of claim 1, further comprising:  
means for sending the loan information to a decision engine to  
perform automated underwriting.
- 10 9. The system of claim 1, further comprising:  
means for sending the loan information to a pricing engine to  
perform automated pricing.
- 15 10. The system of claim 1, further comprising:  
means for sending at least a portion of the loan information to a  
credit update service.
- 20 11. The system of claim 1, further comprising:  
means for sending at least a portion of the loan information to an  
appraisal update service.
- 25 12. The system of claim 1, further comprising:  
means for sending loan documents to a trust company to perform  
a due diligence analysis on the loan documents to certify said loan  
information before said loan information is sent to said second subscriber.

13. A method for exchanging data used in trading financial products in the secondary market, comprising the steps of:
- (a) receiving data, including loan information, for trading of a loan(s) from a first subscriber in a first data format;
  - 5 (b) translating said data into an exchange system default format;
  - (c) applying user-defined filter(s) to said data; and
  - (d) sending said data from the system to a second subscriber in a format selected by said second subscriber.
- 10 14. The method of claim 13, wherein said first subscriber is selected from the group consisting of at least one of the following: a broker, a mortgage bank correspondent, a servicing company, and a mortgage bank investor.
- 15 15. The method of claim 13, further comprising the step of:
- (e) applying a Rule Based Filter (RBF) to said data to perform basic logic checks.
- 16 16. The method of claim 13, wherein said exchange system default format is an XML format.
- 20 17. The method of claim 13, further comprising the step of:
- (e) flagging said loan information which contains Community Reinvestment Act (CRA) qualifying mortgages.
- 25 18. The method of claim 13, further comprising the step of:
- (e) allowing a subscriber to select fee calculations automatically.

19. The method of claim 13, further comprising the step of:  
(e) generating transaction logs of account and trading activity.
- 5 20. The method of claim 13, further comprising the step of:  
(e) sending the loan information to a decision engine to perform automated underwriting.
- 10 21. The method of claim 13, further comprising the step of:  
(e) sending the loan information to a pricing engine to perform automated pricing.
- 15 22. The method of claim 13, further comprising the step of:  
(e) sending at least a portion of the loan information to a credit update service.
- 20 23. The method of claim 13, further comprising the step of:  
(e) sending at least a portion of the loan information to an appraisal update service.
- 25 24. A computer program product comprising:  
control logic stored therein for causing a computer to allow the exchange of data used in trading financial products in the secondary market, said control logic comprising:  
first computer readable program code means for receiving data for trading of a loan(s) from a first subscriber in a first data format;  
second computer readable program code means for translating said data into an exchange system default format;  
third computer readable program code means for applying user-defined filter(s) to said data; and

fourth computer readable program code means for sending said data from the system to a second subscriber in a format selected by said second subscriber.

- 5           25. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method step of enabling trading of a loan(s) via a network site, said method steps comprising:
- 10               (a) receiving data, including loan information, for trading of a loan(s) from a first subscriber in a first data format;
- (b) translating said data into an exchange system default format;
- (c) applying user-defined filter(s) to said data; and
- (d) sending said data from the network site to a second subscriber in a format selected by said second subscriber.
- 15           26. A centralized system for trading financial products in the secondary market, wherein the system is capable of being accessed by a plurality of subscribers, the system comprising:
- means for receiving loan information for a plurality of loans in a
- 20           loan pool from a first subscriber; and
- means for receiving selection inputs from a second subscriber in order to make an acceptance determination regarding each of said loans in said loan pool, whereby said system allows trading of loans in the secondary market.
- 25           27. The system of claim 26, wherein said first subscriber is selected from the group consisting of at least one of the following: a borrower a broker, a mortgage bank correspondent, a servicing company, and a mortgage bank investor.



28. The system of claim 26, further comprising:  
means for receiving selection inputs from said first subscriber in order to create said loan pool.
- 5 29. The system of claim 28, wherein said means for receiving selection inputs from said first subscriber, comprises:  
means for searching said loan information using loan criteria; and  
means for selecting individual loans to include in said loan pool based on said loan information.
- 10 30. The system of claim 26, wherein said means for receiving selection inputs from said second subscriber comprises:  
means for reviewing loan information for each loan in said loan pool;  
15 means for individually accepting, declining or suspending each loan in said loan pool; and  
means for extending an offer on those loans in said loan pool that are accepted.
- 20 31. The system of claim 30, wherein said means for receiving selection inputs from said second subscriber further comprises:  
means for notifying said first subscriber associated with said loan pool of said offer.
- 25 32. The system of claim 30, wherein said reviewing means comprises:  
means for searching said loan information for each loan in said loan pool based on loan criteria.

5           33.    The system of claim 32, wherein said loan criteria is selected from a group consisting of at least one of the following: FICO score, combined loan-to-value ratio, income-to-debt ratio, interest rate, loan amount, term of loan, appraisal value of property, monthly income of borrower, type of loan, points, purchase balance, original balance, and state.

10           34.    The system of claim 26, further comprising:  
                    means for registering at least one rule corresponding to a subscriber's purchasing criteria.

          35.    The system of claim 34, further comprising:  
                    means for reviewing said rule(s) to use in forming said loan pool.

15           36.    The system of claim 34, further comprising:  
                    means for matching said rule(s) to said loan information; and  
                    means for notifying said subscriber when said loan information for one or more of said loans matches said subscriber's rule(s).

20           37.    The system of claim 36, wherein said notifying means notifies said subscriber by at least one of the following devices: pager, electronic mail, cellular telephone, personal digital assistant, and telephone.

          38.    The system of claim 26, further comprising:  
                    means for collecting and analyzing trade data to create an index.

25           39.    The system of claim 38, wherein said trade data are selected from the group consisting of at least one of the following: volume of trades, weighted average coupon, average combined loan-to-value ratio, average

FICO score, average term of loan, average rate, and average debt ratio.

40. The system of claim 38, wherein said index is used to develop a subscriber's rule(s).

5

41. The system of claim 26, further comprising:  
means for forwarding loan information for a loan to a servicing company to service said loan.

10

42. The system of claim 26, further comprising:  
means for trading in a mortgage-backed security that is backed by at least one loan pool.

15

43. A method for trading financial products in the secondary market on a network, wherein the network is capable of being accessed by a plurality of subscribers, the method comprising the steps of:

20

- (a) receiving loan information for a plurality of loans in a loan pool from a first subscriber; and
- (b) receiving selection inputs from a second subscriber in order to make an acceptance determination regarding each of said loans in said loan pool, whereby the method allows trading of loans in the secondary market.

25

44. The method of claim 43, further comprising the step of:  
(c) receiving selection inputs from said first subscriber in order to create said loan pool.

45. A computer program product comprising:

control logic stored therein for causing a computer to allow trading financial products in the secondary market, wherein a plurality of subscribers use said computer program product, said control logic comprising:

5 first computer readable program code means for receiving loan information for a plurality of loans in a loan pool from a first subscriber; and

10 second computer readable program code means for receiving selection inputs from a second subscriber in order to make an acceptance determination regarding each of said loans in said loan pool, whereby said system allows trading of loans in the secondary market.

46. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps of enabling trading of a loan pool via a network site, said method steps comprising:

15 (a) receiving loan information for a plurality of loans in a loan pool from a first subscriber; and  
(b) receiving selection inputs from a second subscriber in order to  
20 make an acceptance determination regarding each of said loans in said loan pool, whereby the method allows trading of loans in the secondary market.

47. A computer program product comprising:

25 control logic stored therein for causing a computer to allow pooling of loans, wherein a plurality of subscribers use said computer program product, said control logic comprising:

first computer readable program code means for receiving loan information;

second computer readable program code means for searching said loan information based on loan criteria; and

third computer readable program code means for selecting loans based on said loan information to include in a loan pool

5

48. A computer program product comprising:

control logic stored therein for causing a computer to develop an index, said control logic comprising:

first computer readable program code means for receiving trade data for a plurality of loans; and

10

second computer readable program code means for analyzing said trade data to create an index.

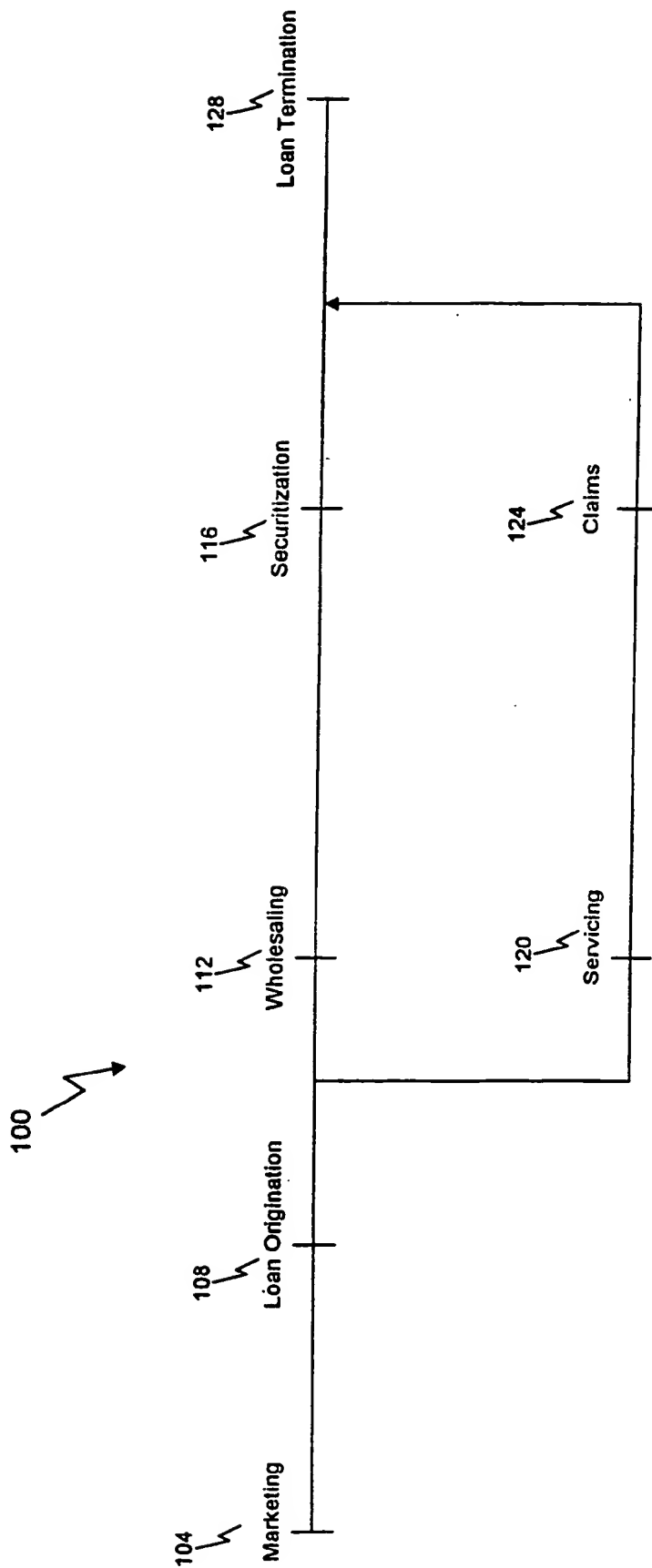


FIG. 1

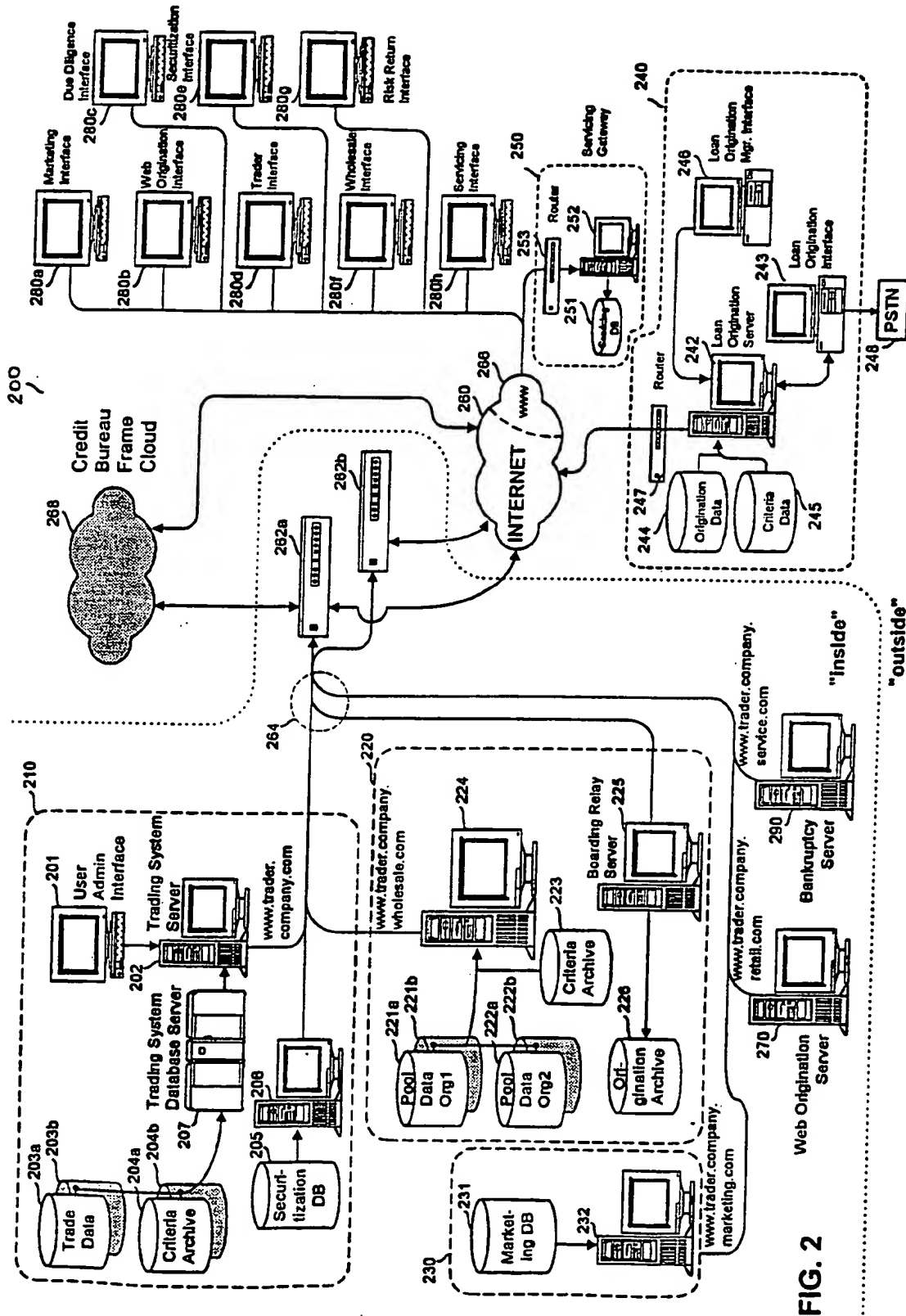


FIG. 2

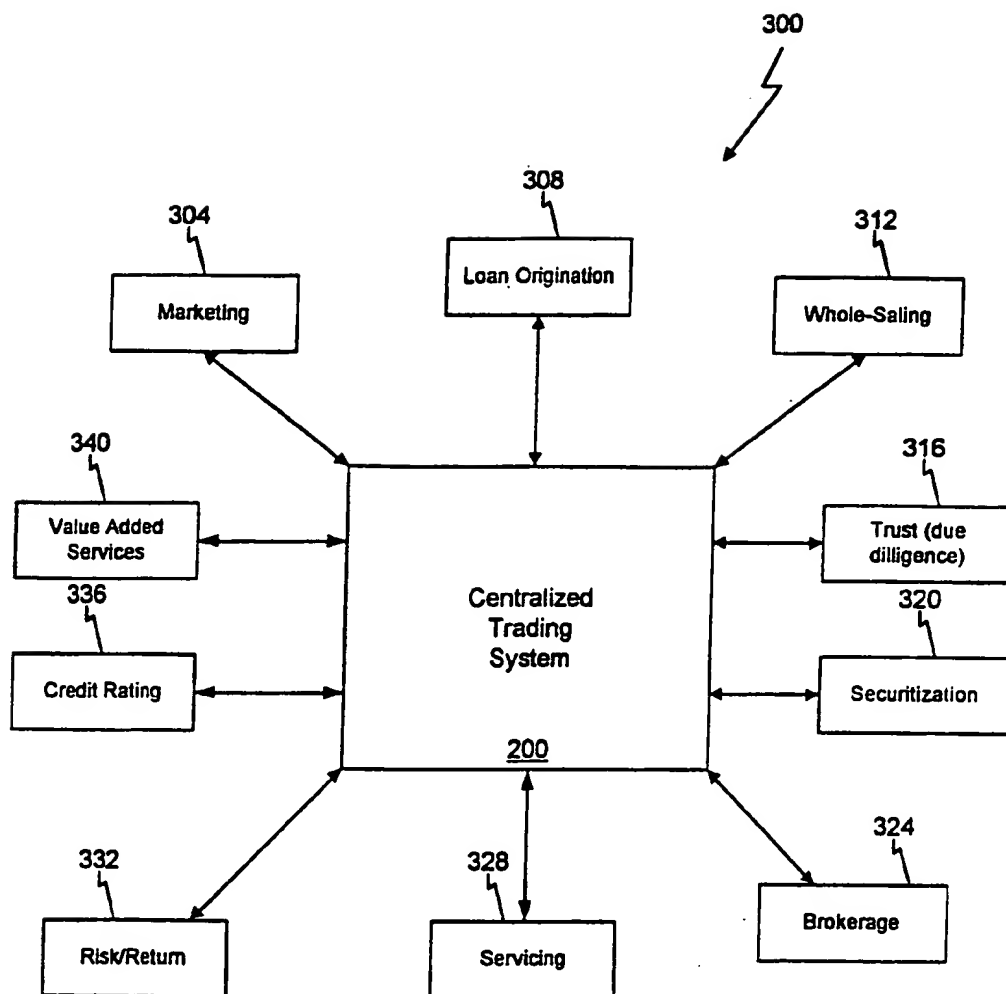


FIG. 3



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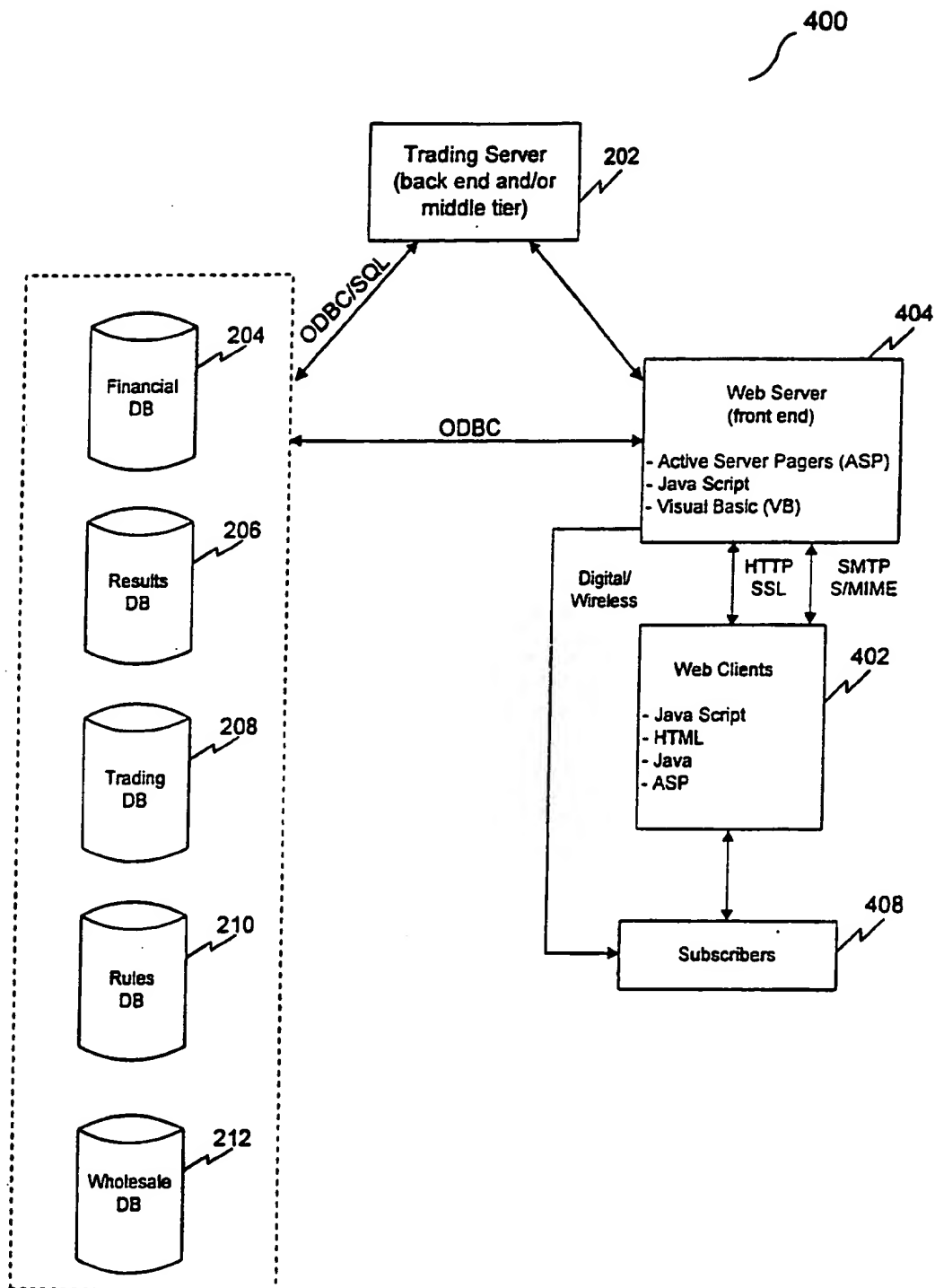


FIG. 4

5/32

500

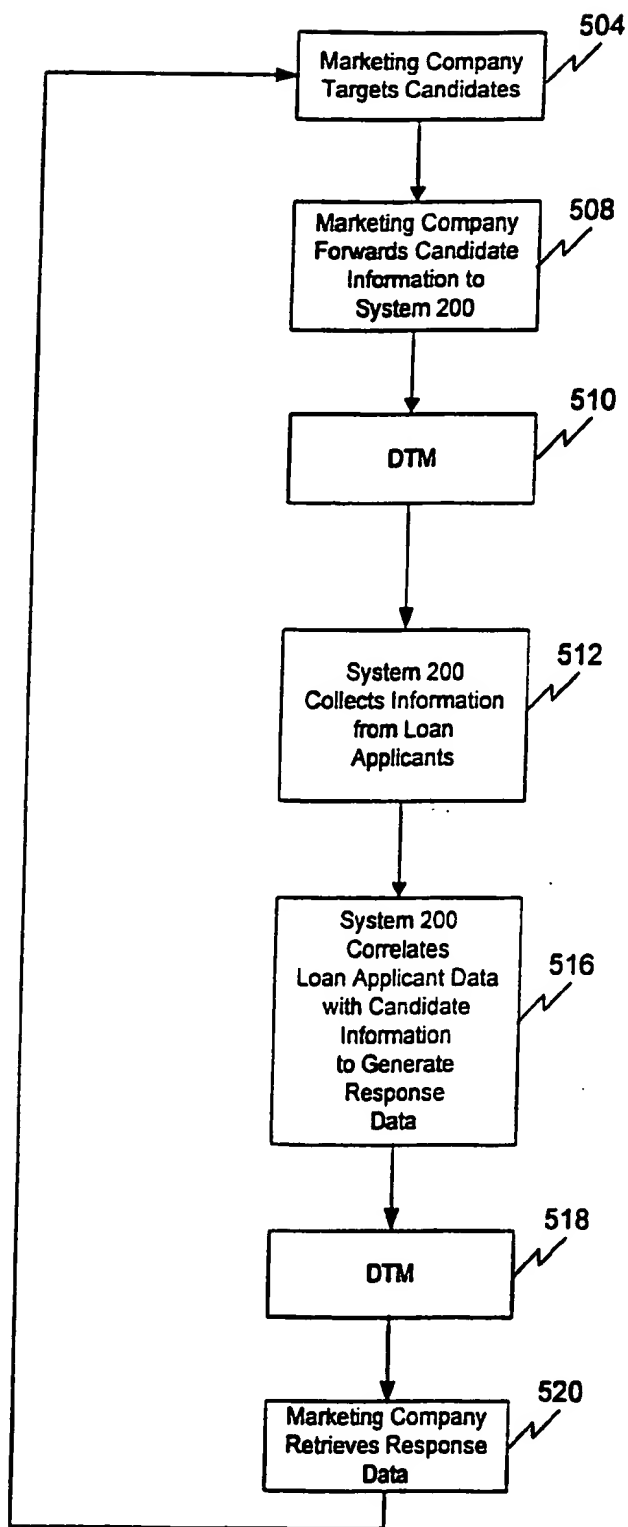


FIG. 5

6/32

## LOAN ORIGINATION

600

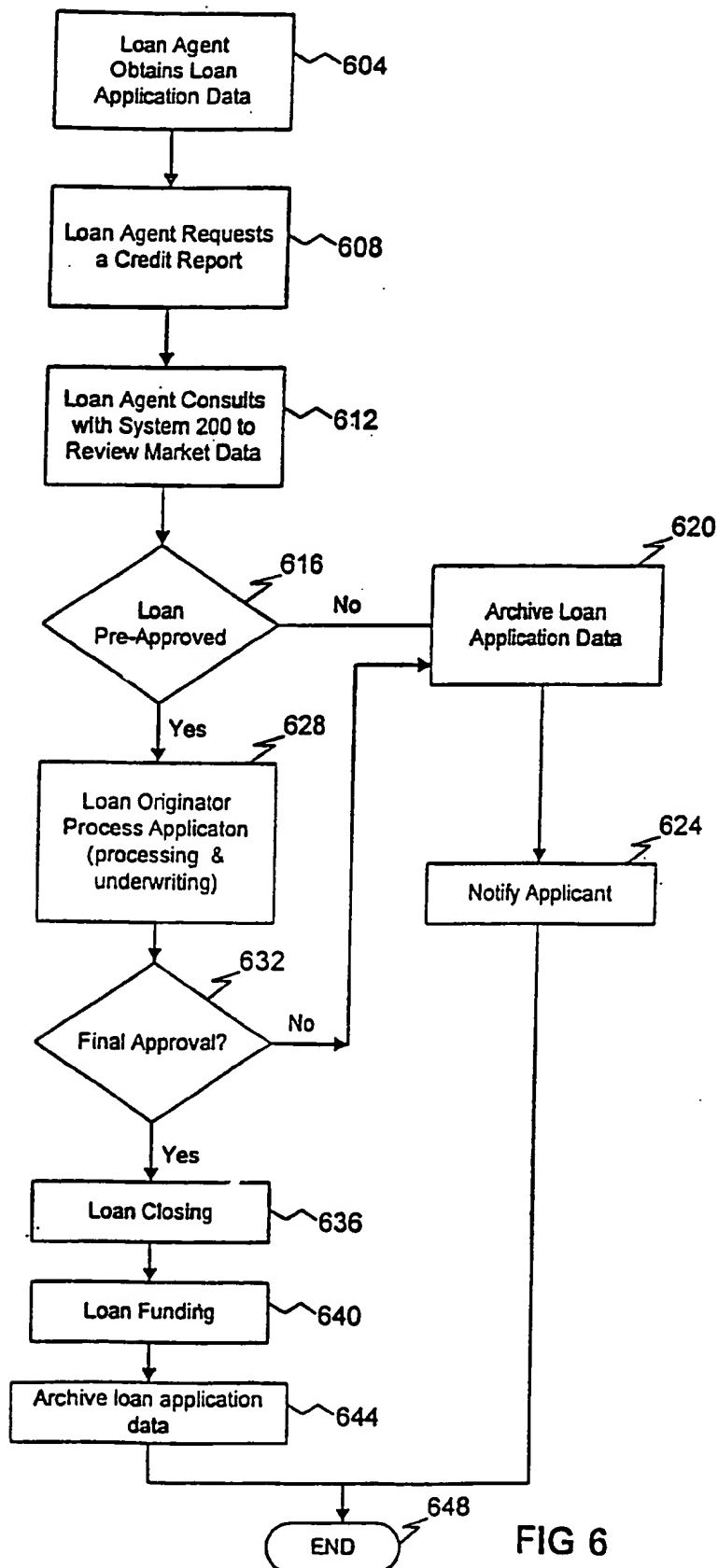


FIG 6

7/32

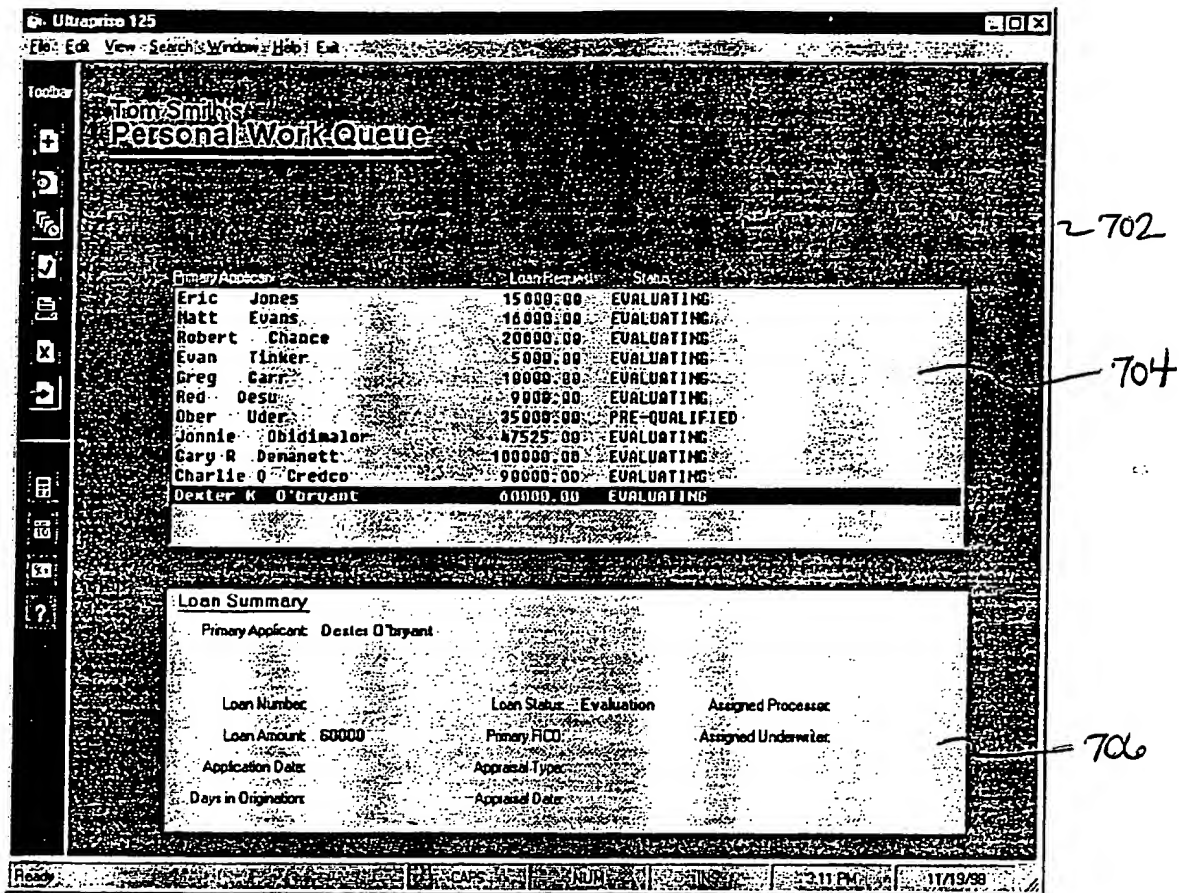


FIG. 7

8/32

804      806      808      810      /      812      814

On: Ultracon 125

File Edit View Search Window Help

Decker O'bryant  
1234567890

Decker O'bryant  
Greer O'bryant

Evaluating

Personal Employment Property Credit Loss Record Loan Simulation

**Primary Applicant**

First Name: Decker Middle: K Last Name: O'bryant  
SSN: 305784680  
Home Phone: 5406533754  
Work Phone: 5406537721  
Education: High School

Current Address  
Street: 15588 O'leary Drive  
City: King George  
State: VA Zip: 22487  
Length: 1 Yrs: 0 Mos: 0

**Nearest Relative**

First Name: Davis Last Name: Gehagen  
Address: 217 Shackelford West Road  
City: Stafford State: VA Zip: 22487  
Phone: 5407524388  
Relationship: Spouse

Previous Address  
Street: 6184 Potomac Drive  
City: Stafford  
State: VA Zip: 22487  
Length: 1 Yrs: 0 Mos: 0

Ready

3:12 PM 11/19/98

802

816

FIG. 8

9/32

912

Ch. Ultraspine 125

File Edit View Search Window Help Exit

Toolbar

Dexter O'bryant  
1234567890

Application Status  
Dexter O'bryant  
Grear O'bryant

Evaluating

Personal Employment Property Credit Report Loan Simulations

Primary Applicant

Current (Primary)	Secondary or Previous 1	Previous 2
Name		
Job Title		
Computer Assistant		
Time at Job	Yr: 10 Mo: 1	Yr: Mo: 1
Supervisor		
Telephone		
Occupational Field		
Self-Employed?		
Income		
Other Income		
Source		
Total Monthly Income	\$000,000.00	\$000,000.00
	705	705
Reason For Leaving		

Submit (let's use the green button)

Ready CAPS GRNUM 11/19/98 3:12 PM

2904

908

FIG. 9

10/32

Ultraprise-125

File Edit View Search Window Help Exit

Toolbox

Dexter O'bryant  
1234567890

Approved List  
Dexter O'bryant  
Gina O'bryant

Application History  
Evaluating...

Personal Employment Property Loan Check Report Simulation

Property Address: 15589 Oakwood Drive  
King George  
VA 22487  
22487

Property Type: 01

Property Liens Appraisal

Ready

1008 1012

1004

11/19/99

FIG. 10

11/32

UltraPro 125

File Edit View Search Window Help

Today: 6 Dexter O'bryant  
12345678907

Account List:  
Dexter O'bryant  
Gwen O'bryant

Evaluating:

Personal Employment Property Credit Report Loan

March Total  
April Total  
May Total  
June Total  
July Total  
August Total  
September Total  
October Total  
November Total  
December Total  
Annual Total

Account Distribution

Historical Delinquencies

Summary Score Joint Subject Spouse Inquiries

Ready: 11/19/98 3:13 PM

1104

1108 1112 1116 1120 1124

FIG. 11



12/32

Q. Ultracase 125

File Edit View Search Window Help

Toolbox

Dexter Obryan  
1234567890

Account List:  
Dexter Obryan  
Gross Obryan

Print Report  
Evaluating

Personal 1994 Income Tax 2000 Property 2000 Credit Report Loan Simulation

Amount Requested: Test7 Rate: Test8 FICO Score: Autocheck

Term: Test8 Loan Type: DB Card

Disbursements

Conclusion	
Cash Disb.	
Base Amount	\$00,000

Loan

Del. Fee	\$00,000
Points	\$00,000
Total Costs	\$00,000

Ratios

Income/Debt Ratio	00.00%
Disposable Income	\$000.00
Consumed LTV	00.00%

Terms

Loan Amount	
Rate	
Term	
Payment	\$000.00

Loan ID Value: 125%

Available: \$000,000

Savings

Total Income	\$00,000
Objections Before	\$00,000
Objections After	\$00,000
Savings/Mo.	\$00,000
Periodic	\$000.00
Payment of	\$000.00
Wt Paid In	

Create Scenario Loan Fees

Ready

1208

1204

FIG. 12

13/32

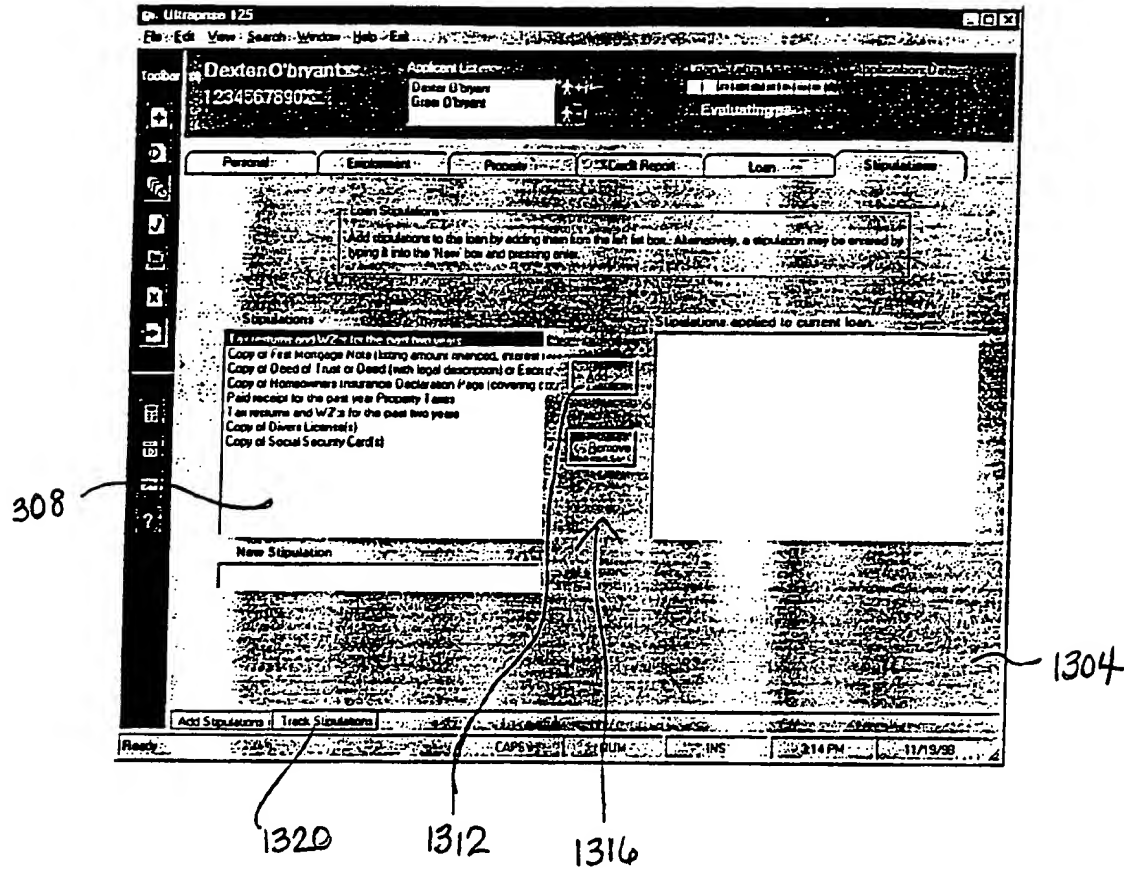


FIG. 13

14/32

**Search**

**Search Marketing Database**

Priority Code  OR

Last Name  Smith

Zip Code

**Search Results**

4 Matches

Name	Zip Code	Priority Code
New Applicant		308-1064514
LOUISE SMITH	30228	Phone 7187388870
PAMELA SMITH	33141	Address 2728 SEXTON PL
KEITH SMITH	10469	City BRONX
GARY SMITH	30133	State NY
		Zip 10469-5204

1416

1408

1412

1420

1404

1424

FIG. 14

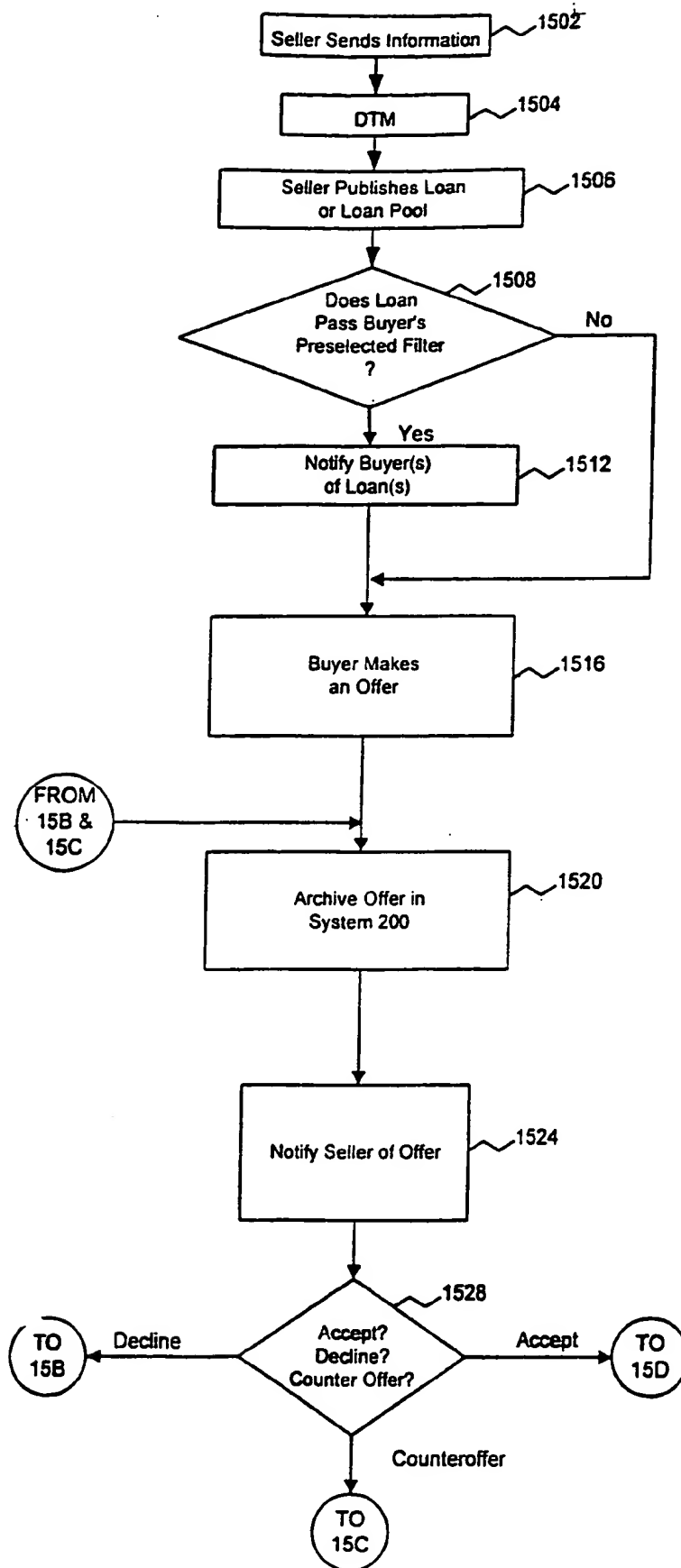


FIG. 15A

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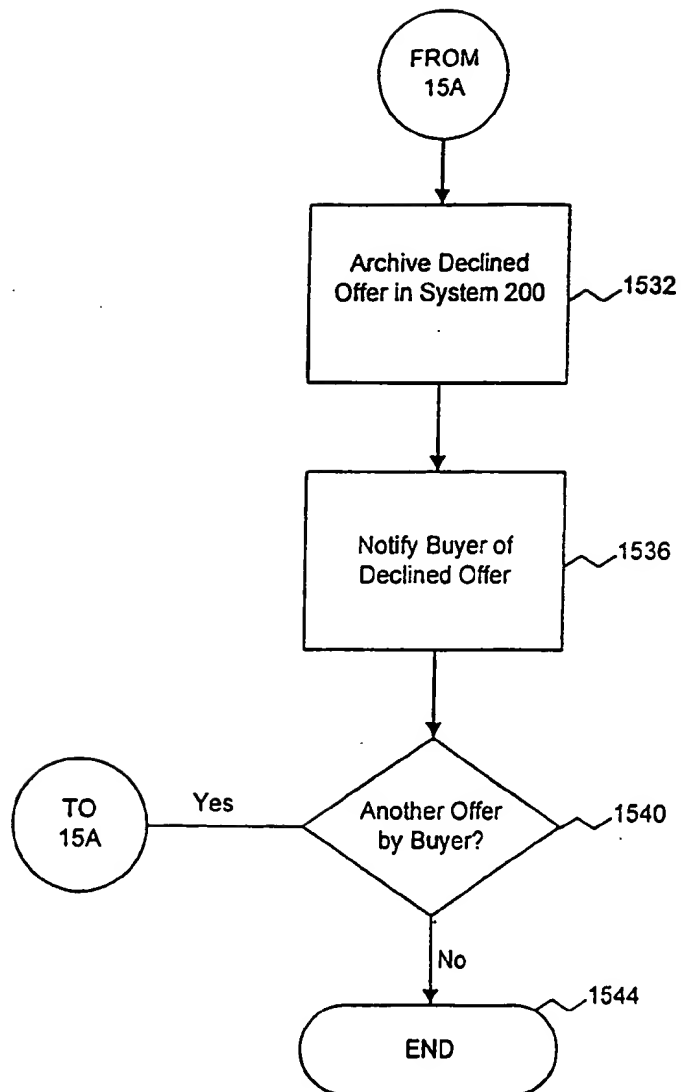


FIG. 15B

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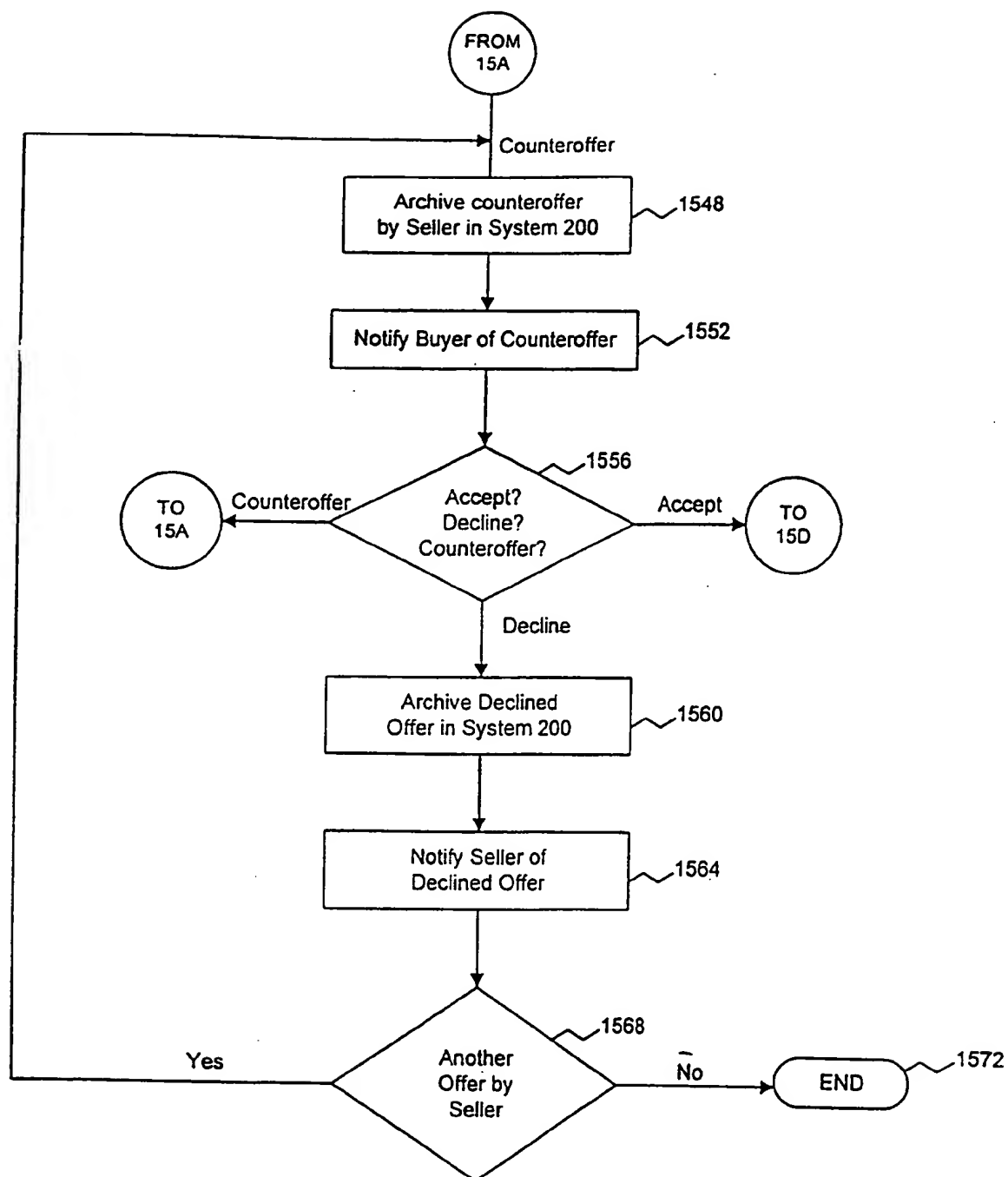


FIG. 15C

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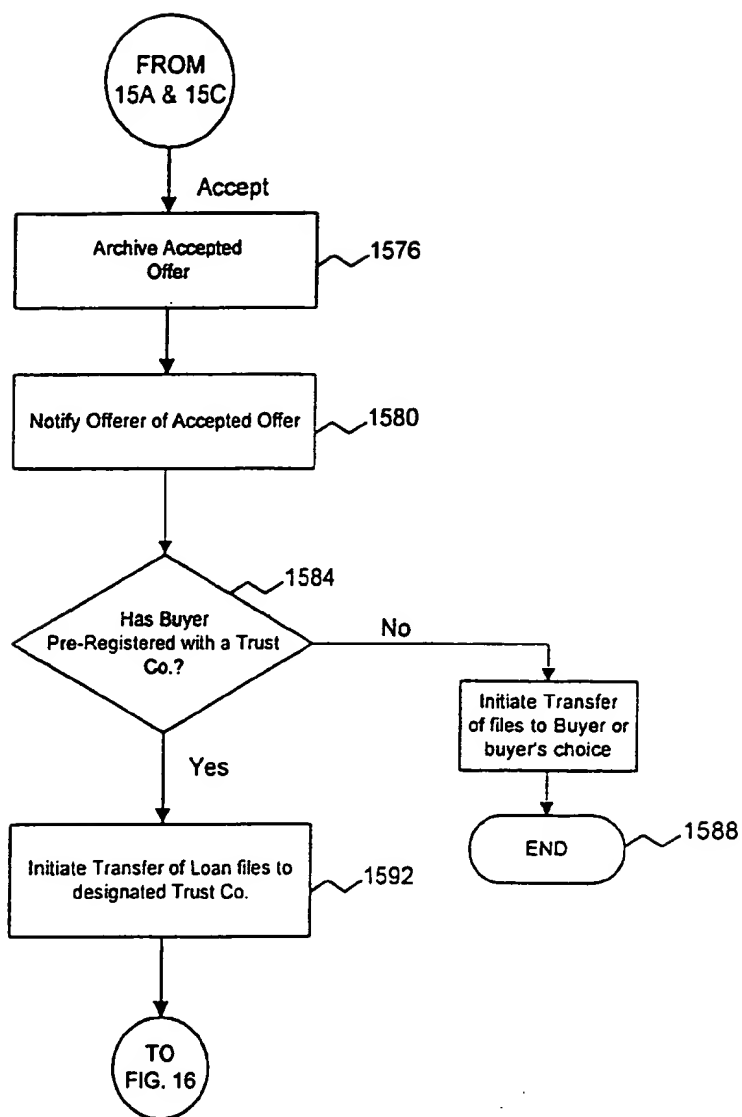


FIG. 15D

19/32

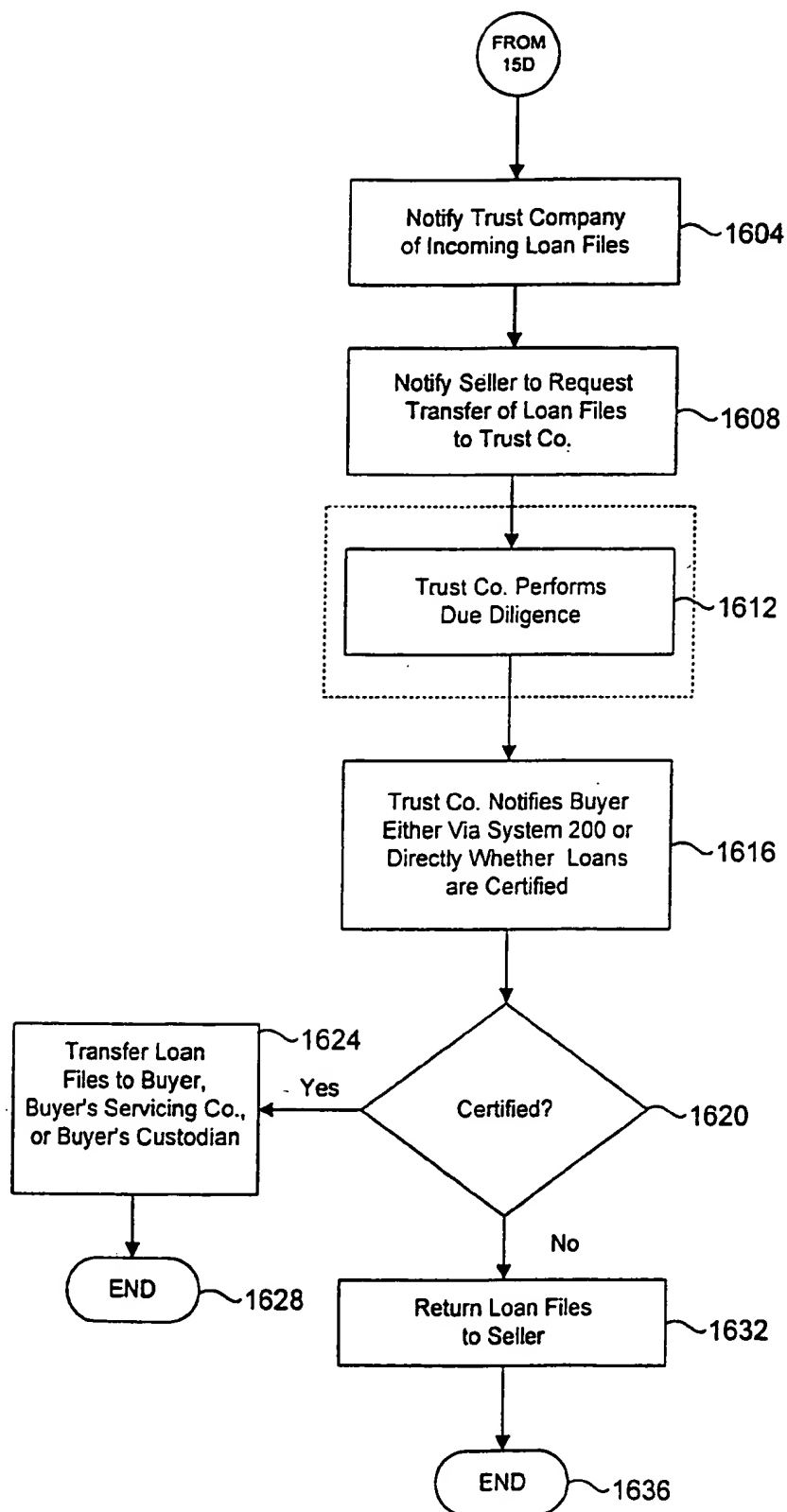


FIG. 16



20/32

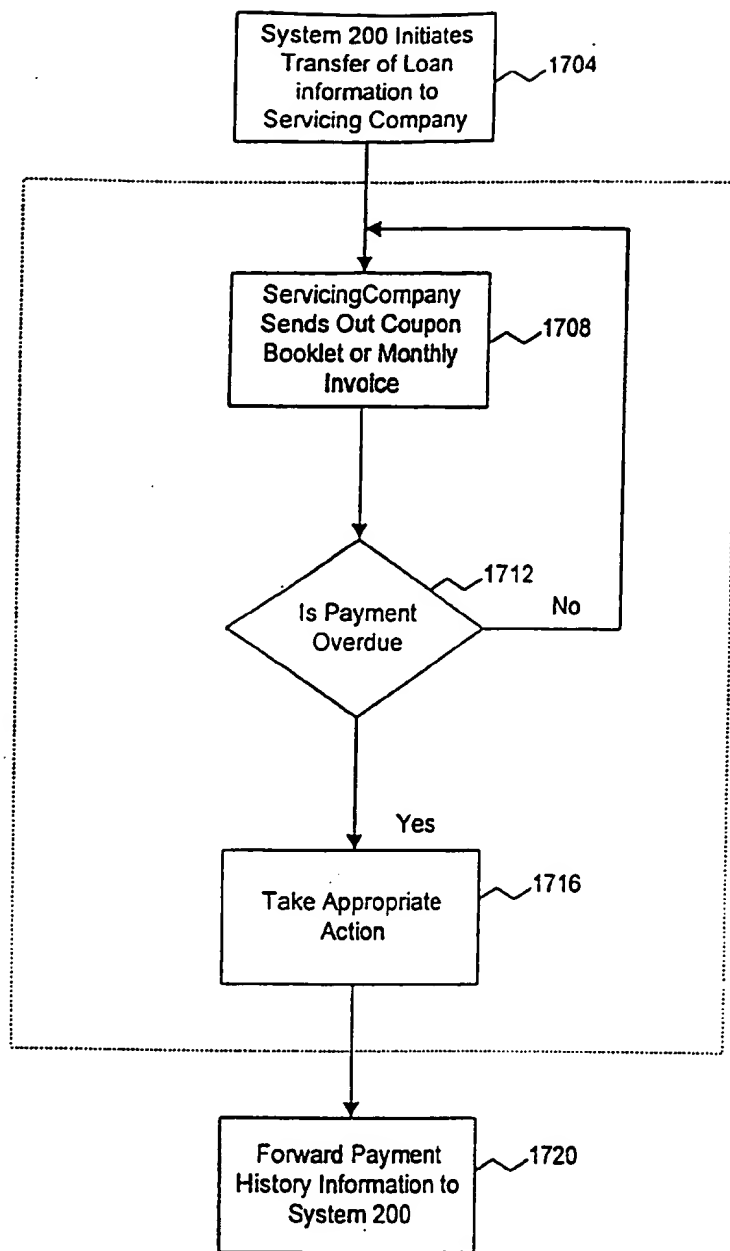


FIG. 17

21/32

**ultraprise.com**

JOHN Q. BUYER Corporate Site

**pool detail**

Column heads allow sorting of the loans based on various criteria.

Click to evaluate pool.

1804

1808

AD/S Status	Loan Number	Borrower Name	FICO	Term	Rate	Off Bal.	State	Type	CLTV	DR
Accept	9202002886	Gourbet, Gustave	667	180	13.75	30,000	VA	SFR	--	38.80
Accept	9202002887	Couture, Thomas	668	240	12.99	55,000	KY	COND	124.7	34.10
Accept	9202002888	Cranach, Lucas the Elder	687	180	12.99	31,500	NJ	SFR	106.1	47.30
Accept	9202002889	Cropsey, Jasper	667	300	12.75	37,500	MO	SFR	109.8	33.30
Accept	9202002890	Daumier, Honor	646	180	13.99	45,000	MS	SFR	112.8	31.90
Accept	9202002891	David, Gerard	715	240	12.75	45,000	NJ	SFR	117.5	41.40
Accept	9202002892	David, Jacques-Louis	717	300	12.75	35,000	PA	SFR	117.7	46.50
Accept	9202002899	Davis, Stuart	712	300	11.75	53,000	NJ	SFR	113.4	41.90

FIG. 18

22/32

<b>Seller Data</b>	
<b>Pricing:</b>	105.5%
<b>Price:</b>	3,945,598

1904

Summary Data					
Accepted Loans		Declined Loans		Suspended Loans	
Number of Loans:	91	Number of Loans:	0	Number of Loans:	0
Par Value (\$):	3,739,903	Par Value (\$):	0	Par Value (\$):	0
WAC:	12.8	WAC:	0.0	WAC:	0.0
WA FICO:	689.5	WA FICO:	0.0	WA FICO:	0.0
WA CLTV:	117.7	WA CLTV:	0.0	WA CLTV:	0.0
WA DR:	40.0	WA DR:	0.0	WA DR:	0.0

1908
1912
1916

FIG. 19

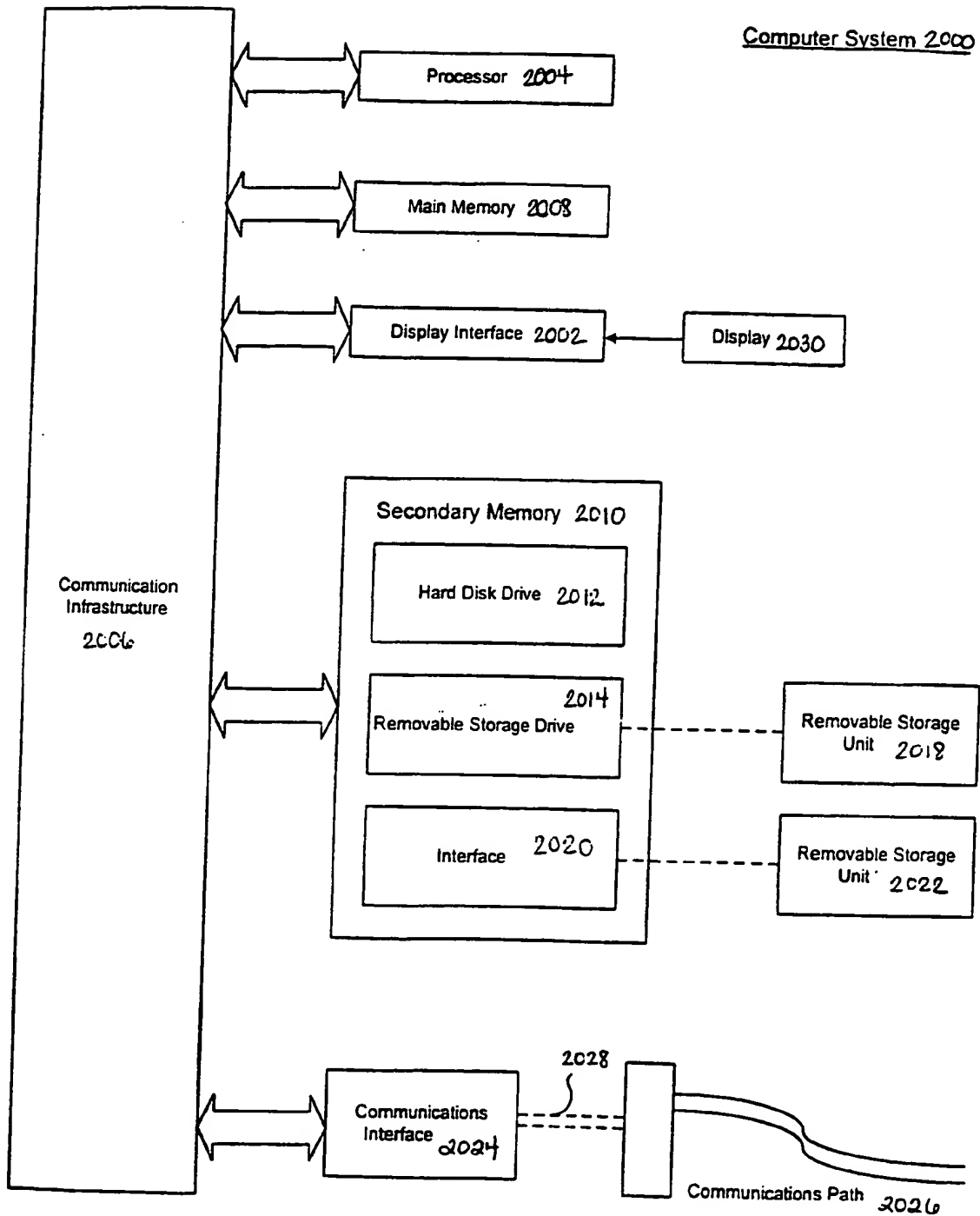


FIG. 20



2204

Ultraprise.com

Corporate Site

evaluate by criteria

2. Calculations are displayed here.

1. Enter your parameters here.

Accept all loans that fall within the parameters indicated below.  
Decline those that fall outside.

**CALCULATE**

FICO ☐ All ☐ Specify:  ☒ Greater Than ☐ Less Than ☐ Score  ☐ Less Than

CLTV ☐ All ☐ Specify:  ☒ Greater Than ☐ Less Than  ☒ Less Than

Debt Ratio ☐ All ☐ Specify:  ☒ Greater Than ☐ Less Than  ☒ Less Than

Original	Accept	Decline	Par Value
86	\$3,485,303	0	0
82	\$3,374,854	4	110,449
82	\$3,374,854	4	110,449

**APPLY TO LOAN DISPLAY**

3. Click to apply your calculations to the pool.

FIG. 22



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Ultraprise.com

JOHN Q. BUYER

Corporate Site

2404

my bids

VIEW: Only my buys

John Q. Buyer

American Mortgage Holding

2408

BUY ALERT

BUYING

Click to see the bid history of this pool.

2412

CLOSED

At this time no pools that you have been bidding on have been withdrawn or sold to others.

FIG. 24



28/32

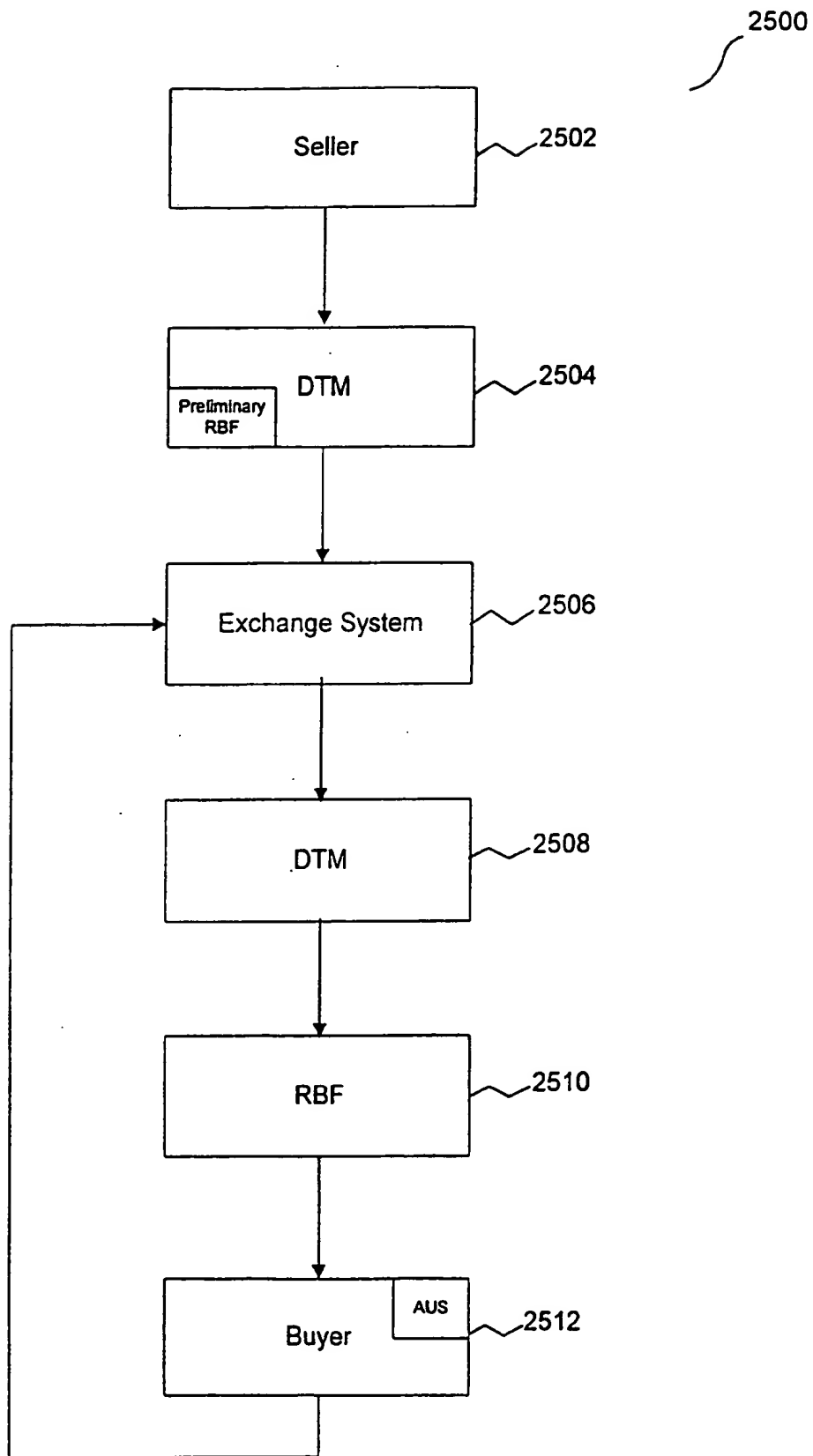


FIG. 25

2600

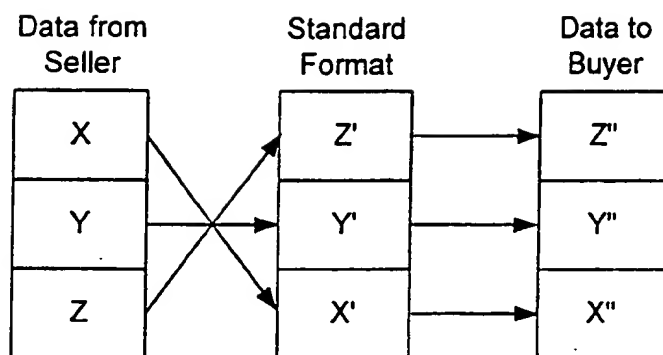


FIG. 26

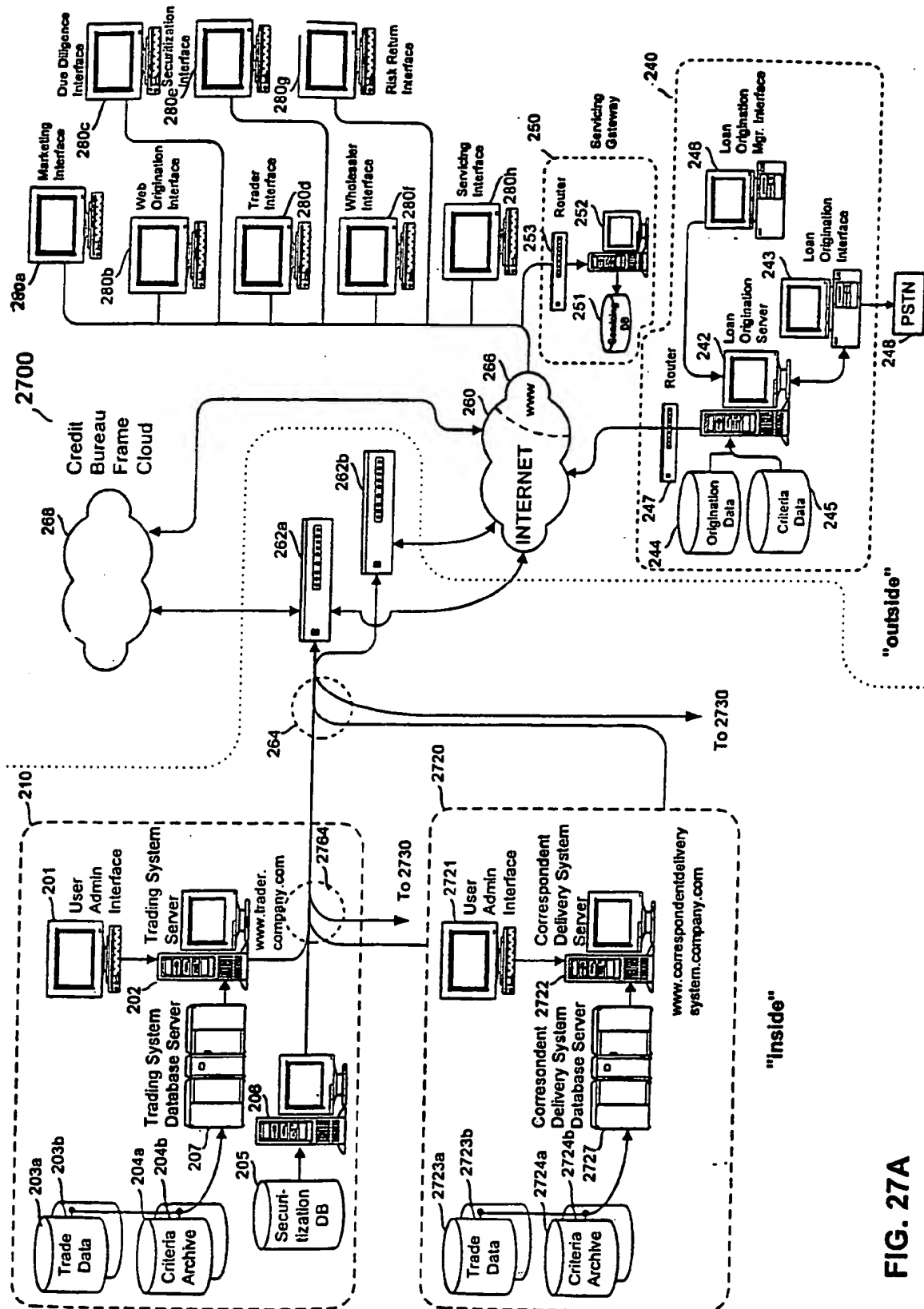


FIG. 27A

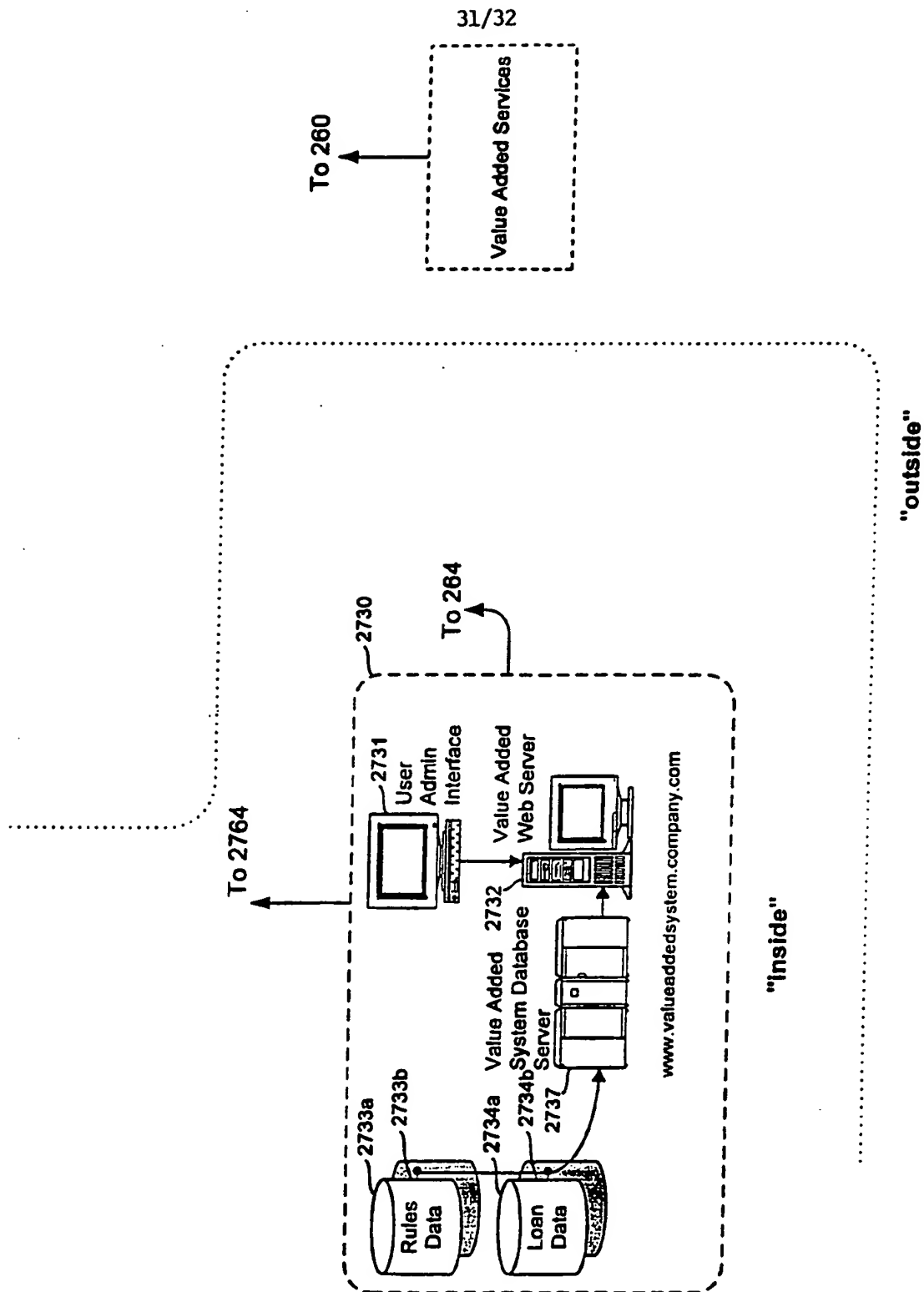


FIG. 27B

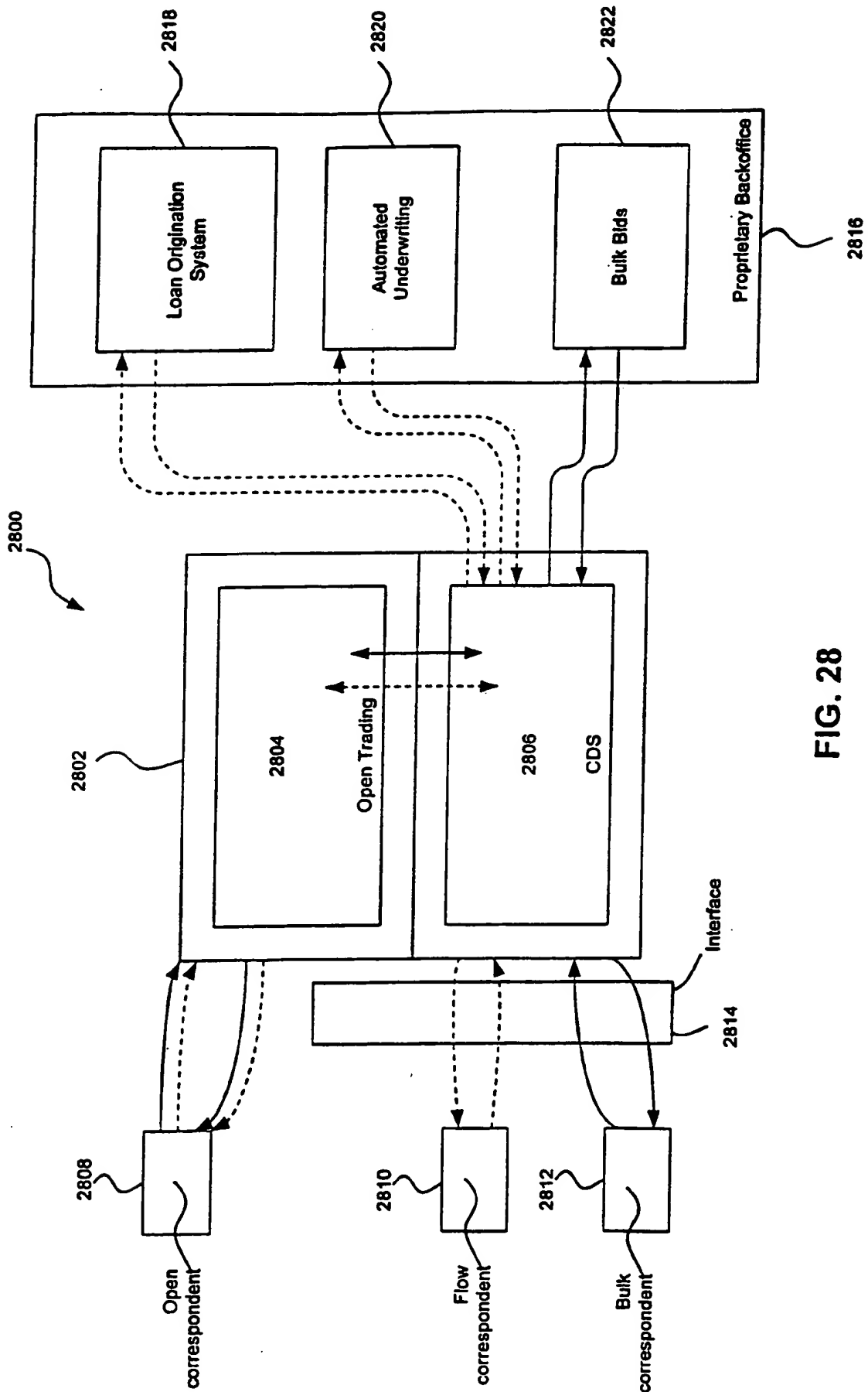


FIG. 28